RAILROAD GAZETTE

FRIDAY, MARCH 4, 1881.

Stevens' Locomotive.

In the *Railroad Gazette* of Sept. 4 and Oct. 1, of last year, descriptions of this locomotive, which was then in process of construction at Concord, N. H., were published. The engravings herewith are taken from the patent specification. In this the inventor says:

"This invention relates to improvements in locomotive engines, and has for its object, among other things, a novel construction and arrangement of the different parts that together united constitute a locomotive engine, and also to economize fuel, and prevent sparks, cinders and excessive smoke.

"One part of my invention consists in a locomotive having a boiler or a steam-generator arranged at the rear of the bogie truck, above the driving-wheels, the said boiler having at its rear end an apartment for the fireman and at its front end an apartment or housing-cab for the engineer, the said engineer's apartment containing the valve-gear and valve-controlling mechanism, all as hereinafter set forth, whereby the engineer is placed at the front of the locomotive, where his view of the track and signals is entirely unobstructed, where he is removed from the presence of smoke, steam and dust, and has all the mechanism for starting, stopping and reversing the locomotive completely under his control. This construction affords additional security to the lives of passengers and safety of rapidly moving trains."

The inventor proposed to dispense with the use of the steam blast for stimulating the draft in the fire. To do this he says "it became necessary for me to provide the locomotive with more rapid and efficient means for generating steam." Fig. 1 is a longitudinal section of the engine, from which it will be seen that the boiler consists of a fire-box, *P*, and combustion chamber, *E*, which, with the former, extends the whole length of the boiler, and both are lined with fire-brick throughout. The boiler proper consists of what may be called a flattened cylinder or shell, *D*, whose form is that of a condensed letter O, and which is supported in the top of the walls of the fire-box and combustion chamber. From this shell are dependent circulating tubes, *E*, extending downward into the fire-span. A section of one of these on an enlarged scale is given by fig. 2. The direction of the circulation of the water in these tubes is shown by the darts. The top and bottom plates of the boiler shell are stayed to each other by the outer tube, which is screwed into the bottom plate, and the bolt h^3, which is screwed into the top plate and into the projection F^3 of the outer tube.

The valve-gear is very complicated, and only elaborate illustrations and descriptions would make its construction clear.

"The front of the structure is made V-shaped, to divide the opposing body of air in the manner of a vessel dividing the water, and thus lessen the power required to drive the locomotive.

"Removable weights, *R*, are provided, by which the pressure of the drivers on the track may be varied at pleasure."

We are not able to say whether this singular engine has yet been completed or tried. It is the invention of Mr. Frank M. Stevens, of Concord, N. H.

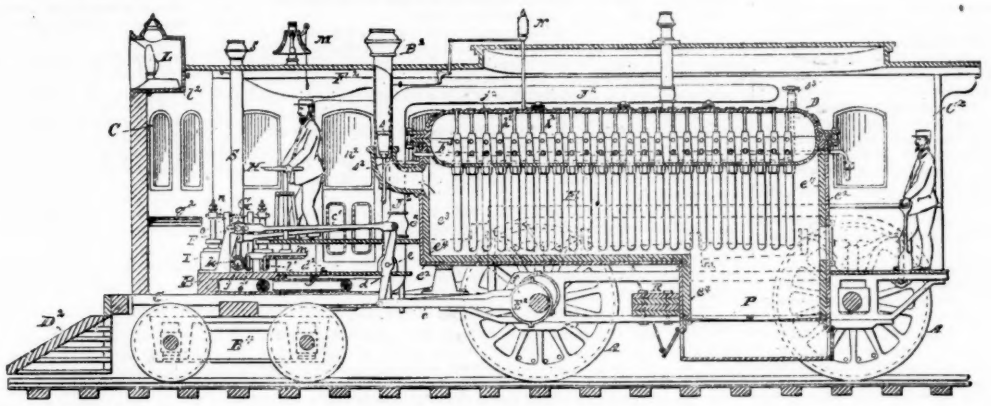


Fig. 1.

THE STEVENS LOCOMOTIVE.

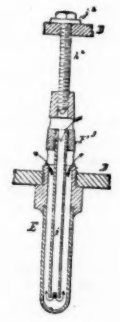


Fig. 2.

Train Accidents in January.

The following accidents are included in our record for the month of January:

REAR COLLISIONS.

On the 1st a freight train on the New York, Lake Erie & Western road ran into a pusher engine standing at Shin Hollow, Pa. The engine was damaged and the engineer hurt.

On the morning of the 3d a yard engine of the Philadelphia & Reading while running out of a siding ran into a passenger train on the main track, damaging several cars, at Belmont, Pa. A man on the yard engine was killed.

On the afternoon of the 3d a freight train on the Pennsylvania road ran into another freight which was pulling out of a siding at Monmouth Junction, N. J., wrecking several cars.

On the morning of the 4th a stock train on the New York Central & Hudson River ran into the rear of a passenger train which had broken down near Savanna, N. Y.

On the evening of the 6th a passenger train on the Philadelphia, Wilmington & Baltimore road ran over a misplaced switch and into a local passenger train standing on a branch track at Lamokin Junction, Pa. Both engines and two cars were wrecked, several other cars damaged, one man hurt so that he died in a short time, and 12 others injured.

On the 7th a freight train on the Illinois Central ran into a preceding freight which had stopped near Anna, Ill., to repair a break on the engine. Several cars were wrecked.

On the night of the 9th a freight train on the New York, Lake Erie & Western ran into a preceding freight near Stockport, N. Y., wrecking two cars.

On the 11th a freight train on the Vandalia Line ran into a preceding freight near Harmony, Ind., wrecking several cars.

On the 12th a passenger train on the Mobile & Ohio ran into the rear of a freight near Union City, Tenn., damaging some cars.

On the 13th a passenger train on the Pittsburgh, Cincinnati & St. Louis road ran into some freight cars which had been run from a siding out on the main track at Unionport, O. The engine and several cars were wrecked, two trainmen and three passengers hurt.

On the morning of the 14th a freight train on the Baltimore & Ohio ran over a misplaced switch and into another freight standing on a siding, wrecking several cars and killing a brakeman.

On the 14th a Lake Shore passenger train ran into the rear of a Cleveland, Columbus, Cincinnati & Indianapolis passenger which had stopped on account of a crossing accident at Berea, O. Several cars were damaged.

On the night of the 14th a freight train on the Indiana, Bloomington & Western road ran into a preceding freight which had stopped for water at Mahomet, Ill., and several cars were wrecked.

On the morning of the 19th a train on the Manhattan Elevated road ran into the rear of a preceding train which had stopped at the Fourteenth street and Ninth avenue station in New York while the engineer repaired the injector, but had sent no signal back. An engine and a car were wrecked and two passengers hurt.

On the evening of the 19th, in a dense fog, a freight train on the Lake Shore & Michigan Southern road ran into the rear of a local passenger train which had stopped near Elkhart, Ind., wrecking the rear car and injuring two passengers.

On the evening of the 19th a passenger train on the Lake Shore & Michigan Southern road ran into the rear of a freight train at Otis, Ind., wrecking three cars and damaging the engine. There was a dense fog at the time.

On the night of the 19th an East Tennessee, Virginia & Georgia freight ran into the rear of a Knoxville & Ohio freight at the junction near Knoxville, Tenn., wrecking several coal cars.

On the morning of the 20th a local passenger train on the Michigan Central ran into a freight near Spencer, Ind.

On the morning of the 20th a freight train on the Virginia Midland road ran into a preceding freight which had stopped for water at Mason, Va., wrecking several cars.

On the night of the 20th a freight train on the Atlantic, Mississippi & Ohio road ran into a preceding freight near Zuni, Va., damaging the engine and two cars.

Very early on the morning of the 21st a freight train on the Illinois Central road ran into the rear of a preceding freight which had been stopped by the washing out of a small bridge near Makanda, Ill. An engine and caboose were badly broken, a fireman and a brakeman killed and a brakeman hurt. A signal was sent back by the first train, but the next one was so close behind there was no time to stop.

Early on the morning of the 21st a freight train on the New York Central & Hudson River road ran into a preceding freight which had stalled near Peekskill, N. Y., wrecking several cars.

On the night of the 21st a freight train on the Sioux City & Pacific ran into a preceding freight near Blair, Neb., wrecking several cars and killing a brakeman.

On the morning of the 22d a freight train on the New York Central & Hudson River road ran over a misplaced switch and into a freight train standing on a siding in St. Johnsville, N. Y. Several cars were badly broken.

On the night of the 22d a passenger train on the New York Central & Hudson River ran into the rear of a flanger which was at work on the track near Jordan, N. Y. Two engines were damaged, the flanger wrecked and the road-master in charge killed.

On the night of the 23d a freight train on the Burlington, Cedar Rapids & Northern ran into a preceding freight near Polo, Ia., wrecking several cars.

On the evening of the 24th a freight train on the Baltimore & Ohio road ran into a preceding freight near Tiffin, O., wrecking an engine and several cars and killing the fireman.

Early on the morning of the 25th a freight train on the Louisville & Nashville road broke in two near Nashville, Tenn., and the rear section afterward ran into the forward one, upsetting one car.

On the 25th a New York Central & Hudson River yard engine ran into a Delaware & Hudson passenger train in Troy, N. Y., doing some damage.

On the evening of the 25th a freight train on the Pittsburgh, Cincinnati & St. Louis broke in two near Hanlin, Pa., and the rear section ran into the forward one, wrecking several cars.

Very early on the morning of the 27th a freight train on the Wabash, St. Louis & Pacific ran into a preceding freight near Decatur, Ill., wrecking 12 cars. Five were burned up.

On the night of the 27th a freight train on the Chicago, Rock Island & Pacific road ran into the rear of a passenger train which had stopped near Tiskilwa, Ill., to fix a broken rail.

On the morning of the 28th a freight train on the New York, Lake Erie & Western road ran into a preceding freight which was standing on the track near Port Jervis, N. Y., wrecking several cars.

Very early on the morning of the 31st a construction train on the Texas & Pacific broke in two at Beaver Creek, Tex., and rear section ran into the other, wrecking several cars and knocking down a trestle bridge.

BUTTING COLLISIONS.

On the afternoon of the 6th there was a butting collision between two passenger trains on the Troy & Greenfield at East Portal of Hoosac Tunnel, Mass. Both engines were damaged and a passenger hurt.

Early on the morning of the 8th there was a butting collision between two freight trains on the Central Railroad of New Jersey at Stony Creek, Pa. Both engines and several cars were wrecked and six trainmen hurt.

On the afternoon of the 11th there was a butting collision between a passenger and a freight train on the Baltimore & Ohio Railroad near Mannington, W. Va., which was caused by a mistake in telegraphic orders. A fireman was hurt.

On the morning of the 15th a misplaced switch in the Pittsburgh, Ft. Wayne & Chicago yard in Ft. Wayne, Ind., caused a butting collision between a freight train and a yard engine.

On the evening of the 19th a passenger train and a freight train on the Chicago & Northwestern road ran together near Western avenue in Chicago, damaging both engines. There was a thick fog at the time.

On the night of the 19th three engines and several cars were wrecked by a butting collision in Albany, N. Y., on the New York Central & Hudson River road.

On the morning of the 20th there was a butting collision between two freight trains on the Lake Shore & Michigan Southern road near Clayton, Ind., by which both engines and several cars were wrecked and a fireman killed.

Very early on the morning of the 22d there was a butting collision between two freight trains on the Pittsburgh, Ft. Wayne & Chicago road near Sheffield, Ill., by which both engines and several cars were wrecked and a brakeman killed.

On the morning of the 22d there was a butting collision between a freight and a passenger train on the New York & Canada road near East Lyon, N. Y., by which four engines and several cars were damaged and two tramps, stealing a ride, killed.

On the morning of the 24th there was a butting collision between two passenger trains on the Pittsburgh, Ft. Wayne & Chicago in Ada, Ind. Both engines were slightly damaged.

On the morning of the 25th there was a butting collision between two freight trains of the Illinois Central in Decatur, Ill.

On the 28th there was a butting collision between two freight trains on the Jeffersonville, Madison & Indianapolis near Jeffersonville, Ind., wrecking both engines and 20 cars.

On the morning of the 29th there was a butting collision on the Baltimore & Ohio near Wilford, Ind., by which both engines and several cars were wrecked. The accident was caused by a misunderstanding of orders.

CROSSING COLLISIONS.

On the night of the 2d a Chicago & Northwestern freight ran into a Chicago, Milwaukee & St. Paul freight at Winona Crossing, Minn., damaging two cars. A fireman was hurt.

On the night of the 5th a freight train on the Memphis Line of the Louisville & Nashville ran into a Southeastern Division freight at the crossing in Guthrie, Ky., wrecking two cars.

On the 13th a Wabash, St. Louis & Pacific yard engine ran into an Illinois Central passenger train at Grand Crossing, Ill., damaging both engines.

On the 13th a New York, Lake Erie & Western freight engine ran into a New York Central & Hudson River freight

at the crossing in Tonawanda, N. Y., damaging both engines.

On the afternoon of the 22d a Delaware, Lackawanna & Western freight train ran into a New York, Ontario & Western passenger train at the crossing at Sidney, N. Y., upsetting and damaging a car. It is said that the usual crossing signal was displayed.

DERAILMENTS, BROKEN RAIL.

Early on the morning of the 1st a passenger train on the Chicago, Milwaukee & St. Paul was thrown from the track at Otter Creek, Wis., by a broken rail, and two cars went down a bank and were wrecked, injuring three trainmen and three passengers.

Near midnight on the 5th a passenger train on the Vermont Central road was thrown from the track near North Charlestown, Vt., by a broken rail. Two cars upset and were damaged.

On the night of the 6th a car of a passenger train on the Chicago & Grand Trunk road was thrown from the track near Battle Creek, Mich., by a broken rail, and six passengers were hurt.

On the 7th several cars of a passenger train on the Chicago, Burlington & Quincy were thrown from the track near Hopkins, Ia., by a broken rail.

On the night of the 9th three cars of a freight train on the Rock Island & Peoria road were thrown from the track near Toulon, Ill., by a broken rail. The conductor was killed.

On the evening of the 10th a car of a passenger train on the Rutland & Bennington road was thrown from the track by a broken rail near Danby, Vt.

Early on the morning of the 14th three cars of a passenger train on the Chicago & Alton were thrown from the track near Dwight, Ill., by a broken rail.

On the morning of the 14th a freight train on the Burlington & Southern was thrown from the track near Viele, Ia., by a broken rail.

On the evening of the 11th some cars of a passenger train of the Wabash, St. Louis & Pacific road were thrown from the track by a broken rail near Woodburn, Ind.

On the night of the 14th two cars of a passenger train on the Cincinnati, Hamilton & Dayton were thrown from the track near Cairo, O., by a broken rail.

Early on the morning of the 18th a passenger train on the Canada Southern road struck a broken rail near Perry, Ont., and all the cars were thrown from the track, some of them being badly broken. Four passengers were hurt.

On the morning of the 18th a passenger train on the Illinois Central was thrown from the track by a broken rail near Minonk, Ill.

On the morning of the 20th three cars of a passenger train on the Chicago & Alton were thrown from the track near Joliet, Ill., by a broken rail.

Very early on the morning of the 21st a passenger train on the Albany & Susquehanna struck a broken rail near Maryland, N. Y., and the sleeping car was thrown over off a small bridge and wrecked, injuring two men slightly.

Early on the morning of the 21st a passenger train on the Chicago, Rock Island & Pacific road struck a broken rail near Pond Creek, Ill., and three cars were thrown from the track and wrecked, and one car caught fire and was burned. One passenger was burned to death, another fatally hurt, the conductor and five passengers less severely injured.

Very early on the morning of the 23d two cars of a passenger train on the Cincinnati, Wabash & Michigan road were thrown from the track near Leesburg, Ind., by a broken rail, injuring three passengers.

On the 23d a freight train on the Wabash, St. Louis & Pacific road was thrown from the track near Danville, Ill., by a broken rail.

On the 24th a passenger train on the Houston & Texas Central was thrown from the track near Hutchins, Tex., by a broken rail.

Early on the morning of the 25th ten cars of a freight train on the Wabash, St. Louis & Pacific road were thrown from the track near Peru, Ind., by a broken rail.

On the 26th a passenger train on the Cleveland, Mt. Vernon & Delaware road struck a broken rail near Millersburg, O., and one car was thrown down a bank and wrecked, injuring 11 passengers.

On the morning of the 27th a passenger train on the Louisville & Nashville road struck a broken rail near McGehee, Ala., and three cars were thrown from the track, injuring two trainmen slightly.

On the night of the 27th ten cars of a coal train on the Chicago, Burlington & Quincy were thrown from the track near Monmouth, Ill., by a broken rail.

On the morning of the 28th a car of a passenger train on the Cincinnati, Wabash & Michigan was thrown from the track near New Paris, Ind., by a broken rail.

On the morning of the 28th six cars of a freight train on the Lake Erie & Western road were thrown from the track near LaFayette, Ind., by a broken rail.

On the night of the 28th three cars of a freight train on the Western Railroad, of Alabama, were thrown from the track near Columbus, Ga., by a broken rail.

On the morning of the 29th a passenger train on the Sunbury & Lewiston Branch of the Pennsylvania was thrown from the track near Middleburg, Pa., by a broken rail. Two cars upset, were wrecked and burned up; five persons were badly, ten less severely, hurt.

On the morning of the 29th a passenger train on the Pittsburgh, Cincinnati & St. Louis was thrown from the track at Possum School House, O., by a broken rail. The engineer was hurt.

On the night of the 30th a freight train on the Richmond & Danville road was thrown from the track near Gibsonville, N. C., by a broken rail. The engine and 13 cars went down a bank; the conductor and fireman were killed, the engineer hurt.

On the morning of the 31st a passenger train on the Rome, Watertown & Ogdensburg road was thrown from the track by a broken rail near Woodward, N. Y. The engine upset and two cars went down a bank. The engineer, fireman, conductor and three others were hurt.

DERAILMENTS, BROKEN WHEEL.

On the 3d a construction train on the Atchison, Topeka & Santa Fe road was thrown from the track by a broken wheel at Arroyo Hondo, N. M., killing one man and injuring four others.

On the evening of the 3d the engine of a passenger train on the Philadelphia & Reading broke two drivers when near Tamaqua, Pa., and was badly wrecked and thrown from the track.

On the night of the 4th several cars of a passenger train on the Wilmington & Weldon road were thrown from the track near Magnolia, N. C., by a broken wheel. The cars were damaged and five persons slightly hurt.

On the morning of the 5th two cars of a passenger train on the Philadelphia & Reading road were thrown from the track at Locust Gap, Pa., by a broken wheel.

On the night of the 7th the engine of a passenger train on the Baltimore & Ohio was thrown from the track near Mt. Vernon, O., by the breaking of a wheel under the engine.

On the night of the 9th a freight train on the Louisville & Nashville road was thrown from the track near Franklin, Ky., by a broken wheel.

On the morning of the 13th the engine of a passenger train on the New York Central & Hudson River was thrown from the track at Oneida, N. Y., by a broken wheel.

On the evening of the 14th several cars of a freight train on the New York, Lake Erie & Western were thrown from the track near Middletown, N. Y., by a broken wheel.

On the evening of the 21st a car of a freight train on the New York Central & Hudson River road was thrown from the track in Rome, N. Y., by a broken wheel.

On the evening of the 21st the caboose of a freight train on the Missouri, Iowa & Nebraska was thrown from the track at Sand Prairie, Ia., by a broken wheel, injuring the conductor and three others.

Near midnight on the 22d a passenger train on the New York, Lake Erie & Western was thrown from the track near Tioga Centre, N. Y. The postal car went down a bank with the baggage and express cars on top of it; the wreck caught fire and was burned up. Five men in the postal car were killed, all being burned to death, and in the other cars 12 were hurt. The accident is supposed to have been caused by a broken wheel.

On the 23d a car of a freight train on the New York, Lake Erie & Western road was thrown off the track near Chester, N. Y., by a broken wheel and went down a bank.

On the morning of the 24th a car of a coal train on the Central Railroad of New Jersey was thrown from the track by a broken wheel on the long bridge near Bergen Point, N. J. When the train was stopped the car rested upon the end of one of the trusses of the draw-span, but did no damage, as it was moving very slowly when it struck the truss.

On the morning of the 25th a car of a passenger train on the New York, Lake Erie & Western road was thrown from the track near Hawthorne, N. J., by a broken wheel.

On the night of the 25th a car of a freight train on the New York, Lake Erie & Western road was thrown from the track at Greycourt, N. Y., by a broken wheel.

On the night of the 25th a car of a coal train on the New York, Lake Erie & Western road was thrown from the track in Middletown, N. Y., by a broken wheel.

On the night of the 25th several cars of a coal train on the New York, Lake Erie & Western road were thrown from the track by a broken wheel near Pond Eddy, N. Y., blocking the road several hours.

On the morning of the 27th a car of a freight train on the New York, Lake Erie & Western road was thrown from the track at Hancock, N. Y., wrecking one car badly. The accident was caused by a broken wheel.

On the 27th a car of a freight train on the Northern Pacific road was thrown from the track at Audubon, Minn., by a broken wheel.

On the afternoon of the 29th a car of a passenger train on the Chicago, St. Paul, Minneapolis & Omaha line was thrown from the track near Merrillan, Wis., by a broken wheel.

On the 31st a car of a freight train on the Boston & Providence was thrown from the track by a broken wheel at East Foxboro, Mass.

DERAILMENTS, BROKEN AXLE.

On the 1st a train on the Sussex Railroad was thrown from the track near Sparta Station, N. J., by a broken axle under the tender. The road was blocked nearly eight hours.

On the evening of the 3d the engine of a passenger train on the St. John & Maine road was thrown from the track near Grand Bay, N. B., by the breaking of an axle.

On the afternoon of the 14th an axle broke under a car in a freight train on the New York & New England road near Rye Crossing, Conn., and 14 cars were thrown from the track, some of them being badly broken.

On the morning of the 18th the tender on a freight train on the New York, Lake Erie & Western road was thrown from the track near Southfield, N. Y., by a broken axle.

On the morning of the 20th the engine of a freight train on the Hanover Junction, Hanover & Gettysburg road was thrown from the track in Gettysburg, Pa., by a broken driving axle.

On the evening of the 21st an axle broke under a shifting engine in the Northern Central yard at Elmira, N. Y., and the engine was thrown across the track and wrecked.

On the afternoon of the 25th the tender of a passenger train on the St. John & Maine road was thrown from the track near Fredericton, N. B., by a broken axle.

On the afternoon of the 25th a passenger train on the New York, Lake Erie & Western road was thrown from the track near Hancock, N. Y., with a broken axle under the tender.

On the morning of the 28th several cars of a freight train on the New York, Lake Erie & Western road were thrown from the track at Rock Run, Pa., by a broken axle, blocking the road three hours.

On the evening of the 31st eight cars of a freight train on the Connecticut & Passumpsic Rivers road was thrown from the track near McIndoes' Falls, Vt., by a broken axle.

DERAILMENT, BROKEN CONNECTING ROD.

About noon on the 15th the locomotive of a passenger train on the New York Central & Hudson River road broke a parallel rod when near Low Point, N. Y., and the broken end of the rod caught in a tie, throwing the engine from the track. The road was blocked over two hours.

DERAILMENTS, BROKEN TRUCK.

On the evening of the 13th two cars of a passenger train on the New York Central & Hudson were thrown from the track at Whitesboro, N. Y., by the breaking of a truck.

On the afternoon of the 21st a car of an emigrant passenger train on the New York Central & Hudson River road was thrown from the track near Rome, N. Y., by a broken truck.

On the afternoon of the 24th several cars of a freight train on the Canada Southern were thrown from the track near Hagersville, Ont., by a broken truck.

DERAILMENTS, LOOSE WHEEL.

On the 11th a car of a passenger train on the St. John & Maine road was thrown from the track near McAdam Junction, N. B., by a loose wheel.

On the morning of the 22d three cars of a passenger train on the Atlanta & Charlotte Air Line were thrown from the track near Gaffney, S. C., by a loose wheel, and the cars went down a bank, injuring two train-men and three passengers slightly.

DERAILMENTS, BROKEN SWITCH-ROD.

On the afternoon of the 1st a passenger train on the Old Colony road was thrown from the track at Weymouth, Mass., by a broken switch rod, and the baggage car was thrown against the station and wrecked. The engineer and a passenger were hurt.

On the morning of the 6th a passenger train on the St. Paul & Duluth road was thrown from the track in Stillwater, Minn., by a broken switch-rod.

On the morning of the 28th ten cars of a freight train on the Central Vermont were thrown from the track at Highgate Springs, Vt., by a broken switch-rod.

DERAILMENTS, BROKEN BRIDGE.

Very early on the morning of the 1st a freight train on the Texas & Pacific road broke through a small bridge near Sulphur, Tex. Several cars went down and were wrecked, and a brakeman was badly hurt.

On the 4th the engine of a passenger train on the Charleston & Savannah road broke through the bridge over the Ashepoo River, S. C., and went into the river. The fireman and wood-passenger were drowned.

On the night of the 7th two cars of a freight train on the Chicago, St. Paul, Minneapolis & Omaha road broke through a trestle bridge at McShane Creek, Minn., and were wrecked.

Early on the morning of the 12th a freight train on the New York & Greenwood Lake road broke through the bridge over the Pequannock near Pompton Junction, N. J., and several cars went down upon the ice. The bridge was a wooden truss bridge and not new. It is said that two cars jumped the track and struck the bridge truss, knocking it down.

On the morning of the 21st the engine of a freight train on the Northern Pacific road broke through a trestle bridge at New Tacoma, Wash. Ter., and fell into the water.

DERAILMENTS, SPREADING OF RAILS.

On the morning of the 3d three cars of a passenger train on the Bennington & Rutland road were thrown from the track near North Bennington, Vt., by the spreading of the rails. One car went down a bank and was wrecked, injuring two men.

Very early on the morning of the 18th a passenger train on the Houston and Texas Central was thrown from the track near Sherman, Tex., by the spreading of the rails. The engine upset, injuring the engineer and fireman.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the 5th a passenger train on the South & North Alabama road ran into a rock which had fallen on the track near Birmingham, Ala., and the engine upset down a bank.

On the morning of the 10th a passenger train on the Dubuque Division of the Chicago, Milwaukee & St. Paul ran into a mass of ice which had fallen on the track near Elk River, Ia. The engine was thrown down a bank.

On the afternoon of the 20th a freight train on the Lake Erie & Western road ran into a hand car near Bluffton, Ind., and several cars were thrown from the track. Two trackmen were hurt.

On the morning of the 22d a freight train on the East Tennessee, Virginia & Georgia ran into a rock which had fallen on the track at Loudon Bluff, Tenn., wrecking the engine and two cars.

Very early on the morning of the 27th a freight train on the Pennsylvania Railroad was thrown from the track near Dillerville, Pa., by two telegraph poles, which had fallen a moment before from a train passing on the other track.

DERAILMENT, CATTLE.

On the 27th a freight train on the Pine River Valley Branch of the Chicago, Milwaukee & St. Paul ran over a horse near Richland Centre, Wis., and the whole train was thrown from the track, and the fireman killed.

DERAILMENTS, LAND-SLIDE.

On the night of the 7th a passenger train on the Richmond & Danville ran into a land-slide near Lexington, N. C. The whole train was thrown from the track, the engine and postal car wrecked, the engineer and fireman killed, and five passengers hurt.

Early on the morning of the 24th a freight train on the Buffalo & Southwestern ran into a landslide near Gowanda, N. Y., and the engine and several cars went down a bank, killing the fireman and injuring the engineer.

DERAILMENTS, SNOW.

On the 9th a car of a passenger train on the Northern Pacific was thrown from the track at East St. Cloud, Minn., by ice on the rails.

On the night of the 17th nine cars of a freight train on the New York, Lake Erie & Western road were thrown from the track in Goshen, N. Y., by snow packed down on the rails.

On the morning of the 22d twelve cars of a freight train on the Buffalo & Southwestern road ran off the track near Hamburgh, N. Y., in a snowdrift.

On the morning of the 22d a snow-plow on the Buffalo & Southwestern road ran off the track in a snow bank near Buffalo, N. Y., and the road was blocked some time.

On the morning of the 22d two cars of a passenger train on the Eastern Railroad were thrown from the track near Lynn, Mass., by snow packed down on the rails.

On the 27th the engine of a passenger train on the Delaware, Lackawanna & Western ran off the track in a snow drift near New Hartford, N. Y.

On the evening of the 27th a passenger train on the Michigan Central was thrown from the track at Lake, Ill., by snow packed down in a frog.

On the morning of the 29th an engine and snow-plow on the Concord & Claremont road ran off the track in a drift near West Concord, N. H., and two men were hurt.

DERAILMENTS, MISPLACED SWITCH.

On the morning of the 3d a construction train on the Grape Creek Branch of the Chicago & Eastern Illinois was thrown from the track by a misplaced switch and the conductor and four laborers hurt.

On the morning of the 4th a car of a passenger train on the Pennsylvania Railroad was thrown from the track in Newark, N. J., by a misplaced switch and slightly damaged.

On the morning of the 7th a passenger train on the Fitchburg road was thrown from the track at Wachusett, Mass., by a misplaced switch. Two men were hurt.

On the afternoon of the 10th the engine of a passenger train on the New York & New England road was thrown from the track at Melrose, Conn., by a misplaced switch.

On the night of the 13th a passenger train on the Wabash, St. Louis & Pacific road was thrown from the track at Niantic, Ill., by a misplaced switch.

On the evening of the 14th a passenger train on the Western & Atlantic road was thrown from the track in Chattanooga, Tenn., by a misplaced switch.

On the morning of the 15th a freight train on the Western & Atlantic road was thrown from the track by a misplaced switch in Marietta, Ga., and the engine upset.

On the 20th a freight train on the Illinois Central road was thrown from the track near Bloomington, Ill., by a misplaced switch.

On the night of the 22d a passenger train on the Great Western was thrown from the track at Bothwell, Ont., by a misplaced switch and the engine upset, injuring the engineer.

On the night of the 24th a passenger train on the Terre Haute & Indianapolis road was thrown from the track in Effingham, Ill., by a misplaced switch, three cars leaving the track and blocking the road eight hours. A brakeman was slightly hurt.

On the morning of the 25th the tender and one car of a passenger train on the Pittsburgh & Lake Erie were thrown from the track at Middletown, Pa., by a misplaced switch.

On the morning of the 30th a yard engine at Erie, Pa., on the Erie & Pittsburgh road was thrown from the track in Erie, Pa., by a misplaced switch. The engineer was hurt.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the night of the 3rd 12 cars of a freight train on the New York Central & Hudson River were thrown from the track near Amsterdam, N. Y.

On the 4th five cars of a passenger train on the Atchison,

Topeka & Santa Fe road were thrown from the track near Raymond, Kan., and slightly damaged.

On the afternoon of the 6th a Southeastern freight engine broke through the ice-bridge over the St. Lawrence from Montreal to Longneuil, P. Q., and went down in 30 ft. of water.

On the 6th a freight train on the Louisville & Nashville road ran off the track at Silver Fork, Ky., and a brakeman was hurt.

On the night of the 6th the rear truck of a car of an express train on the New York Central & Hudson River road jumped the track near Syracuse, N. Y., and the car was dragged nearly a mile before the train was finally stopped, but without causing any serious damage.

On the morning of the 7th two cars of a passenger train on the Connecticut & Passumpsic Rivers road ran off the track near East Coventry, Vt., and were wrecked, killing one passenger and injuring 21 persons.

On the 7th several cars of a freight train on the Wabash, St. Louis & Pacific ran off the track in Hannibal, Mo.

On the 7th the engine of a freight train on the Lehigh Valley road ran off the track in Phillipsburg, N. J.

On the afternoon of the 7th some cars of a freight train on the Baltimore & Ohio ran off the track at Mt. de Chantal, W. Va.

On the morning on the 9th two cars of a passenger train on the Houston & Texas Central road ran off the track near Corsicana, Tex., and upset.

On the morning of the 10th four cars of a coal train on the Pittsburgh, Cincinnati & St. Louis ran off the track near Camp Hill, Pa., and a brakeman was hurt.

On the morning of the 11th several cars of a freight train on the New York Central & Hudson River road were thrown from the track near Cold Spring, N. Y., blocking the road two hours.

On the night of the 11th the rear car of a passenger train on the Wabash, St. Louis & Pacific road ran off the track near Mitchell, Ill., upset, injuring 13 persons.

On the afternoon of the 12th a freight train on the Boston & Albany road ran off the track near Hinsdale, Mass., blocking the road two hours.

On the morning of the 14th a passenger train on the St. Louis, Keokuk & Northwestern ran off the track at Canton, Mo.

On the 14th a Kentucky Central passenger train was thrown from the track near Lair, Ky., where some trackmen had taken up a rail and put out no signals.

Very early on the morning of the 15th the engine of a freight train on the Midland Railroad, of New Jersey, was thrown from the track near Snufftown, N. J., blocking the road six hours.

Very early on the morning of the 16th a freight train on the Pennsylvania Railroad ran off the track at Bear Swamp, N. J., and several cars were wrecked.

On the morning of the 16th several cars of a freight on the New York, Lake Erie & Western ran off the track near Howells, N. Y.

On the 18th a car of a passenger train on the New York Central & Hudson River road ran off the track near Oneida, N. Y., delaying the train two hours.

On the morning of the 19th two cars of a passenger train on the St. Lawrence & Ottawa road ran off the track near Osgood, Ont., doing some damage.

On the evening of the 20th, near Mattoon, Ill., some cars of a freight train on the Indianapolis & St. Louis road ran off the track.

Very early on the morning of the 21st a freight train on the Louisville & Nashville road ran off the track near Green River, Ky., blocking the track five hours.

On the afternoon of the 21st several cars of a freight train on the Peoria, Pekin & Jacksonville road ran off the track near Hollis, Ill., and one car was wrecked.

On the morning of the 22d the engine of a freight train on the New York, Lake Erie & Western ran off the track at Greycourt, N. Y., blocking the road two hours.

On the morning of the 22d a gravel train on the Louisville & Nashville road ran off the track near Lake Catherine, La., wrecking the engine and killing a laborer.

On the afternoon of the 22d six cars of a freight train on the Midland Railroad, of New Jersey, were thrown from the track near Newfoundland, N. J., where some trackmen had taken up a rail and had neglected to put out a signal.

On the night of the 23d 12 cars of a freight train on the Grand Rapids & Indiana road ran off the track at Wallen, Ind.

On the evening of the 24th a freight train on the New York, Pennsylvania & Ohio road was thrown from the track near Jamestown, N. Y., blocking the road six hours.

On the night of the 24th three cars of a freight train on the Utica & Black River road were thrown from the track near Glendale, N. Y., and wrecked.

At noon on the 26th a car of a passenger train on the Buffalo, New York & Philadelphia ran off the track in Buffalo, N. Y.

On the morning of the 26th the engine of a passenger train on the New York, New Haven & Hartford road ran off the track near Middletown, Conn., and ran over a bridge on the ties before it could be stopped.

On the afternoon of the 26th five cars of a freight train on the New York, New Haven & Hartford road ran off the track in Hartford, Conn., but did no serious damage.

On the night of the 26th a car of a freight train on the New York Central & Hudson River ran off the track in Rochester, N. Y., and knocked down a corner of the depot.

On the morning of the 27th a passenger train on Morgan's Louisiana & Texas road ran off the track near Terrebonne, La., doing some damage.

On the 27th a freight train on the Central Iowa ran off the track near Grinnell, Ia.

On the 27th a construction train on the Atlantic & Pacific road ran off the track near Laguna, N. M., killing an Indian, injuring another and the engineer.

On the night of the 27th some cars of a freight train on the Cincinnati, Indianapolis, St. Louis & Chicago ran off the track near Valley Junction, O.

On the night of the 27th seven cars of a freight train on the Texas & St. Louis ran off the track and were wrecked at Black Fork, Tex., injuring a brakeman.

On the 28th the engine of a passenger train on the Wellington, Grey & Bruce road ran off the track near Paisley, Ont., and upset.

Early on the morning of the 29th a freight train on the Grand Trunk ran off the track at Highland Creek, Ont., and ten cars went off the bridge and were wrecked. The wreck burned up; a boy was burned to death and a brakeman hurt.

On the morning of the 31st a freight train on the Dunkirk, Allegheny Valley & Pittsburgh road was thrown from the track at Irvineton, Pa., where trackmen had taken up two rails but put out no signal.

On the morning of the 31st a passenger train on the Northern Railway, of Canada, ran off the track near Holland Landing, Ont. A man jumped from the caboose and was killed.

On the evening of the 31st several cars of a freight train on the Chicago & Northwestern road ran off the track at Central Park, Ill., and two cars were wrecked.

On the night of the 31st a car of a passenger train on the New York Central & Hudson River road ran off the track near Kirkville, N. Y., delaying the train two hours.

On the night of the 31st the engine of a freight train on the New York, Lake Erie & Western road ran off the track in Middletown, N. Y.

BROKEN WHEEL NOT CAUSING DERAILMENT.

On the morning of the 3d the engine of a passenger train on the Housatonic road broke a wheel near Pittsfield, Mass.

On the morning of the 11th a driving wheel broke under the locomotive of a passenger train on the St. Paul, Minneapolis & Manitoba road near Minneapolis, Minn. The engine did not leave the track, but the train was delayed until another engine could be procured.

On the morning of the 16th a wheel broke under the baggage car of a passenger train on the New York, Lake Erie & Western road near Owego, N. Y. The car ran some distance with the broken wheel, but did not leave the track.

On the 20th as a passenger train on the Delaware, Lackawanna & Western road was near Stroudsburg, Pa., a driving wheel tire broke in several places. A large piece was thrown through the cab, wrecking one side of it and injuring the fireman slightly.

On the evening of the 20th a wheel broke under a passenger car on the Boston & Providence road at West Mansfield, Mass., but the car did not leave the track.

On the evening of the 22d when a passenger train on the New York & Harlem road was near Amenia, N. Y., a driving wheel broke, wrecking one side of the engine and tearing a hole in the boiler.

On the evening of the 24th the tire of a driving wheel on the engine of a passenger train on the Philadelphia & Reading road broke near Mill Creek, Pa. A large piece was thrown up through the cab, breaking it up and just missing the engineer. The engine did not leave the track.

On the morning of the 25th a driving wheel broke under the engine of a passenger train on the Chicago, Rock Island & Pacific near Utica, Ill.

On the morning of the 29th a tire broke on the driving wheel of the engine of a passenger train on the Lake Shore & Michigan Southern road near Conneaut Bridge, O. The pieces of the wheel flew up through the cab, doing some damage. The engine did not leave the track.

On the morning of the 29th a wheel broke under a sleeping car of a passenger train on the New York, Lake Erie & Western road when near Turners, N. Y., delaying the train some time.

On the morning of the 26th a wheel broke under a tender of a passenger train on the Geneva, Ithaca & Sayre road, but the tender ran five miles without leaving the road.

On the 29th the engine of a freight train on the Rochester & State Line broke a wheel near Machias, N. Y., but did not leave the track.

OTHER BREAKAGES.

On the morning of the 13th the engine of a passenger train on the New York, Lake Erie & Western road broke a parallel rod when near Hohokus, N. J., doing a little damage.

On the morning of the 22d the engine of a passenger train on the Wabash, St. Louis & Pacific road broke a connecting rod near Ft. Wayne, Ind., doing some damage.

On the morning of the 25th the locomotive of a passenger train on the Central Railroad, of New Jersey, broke an axle when near Elizabethport, N. J., but did not leave the track.

On the afternoon of the 31st the engine of the milk train on the Housatonic road broke a parallel rod near Pittsfield, Mass., and the loose end tore a hole in the boiler, disabling the engine.

On the evening of the 31st the engine of a passenger train on the Midland Railroad, of New Jersey, broke a connecting rod when near Hamburg, N. J., and the loose end tore a hole in the boiler, letting out all the steam.

On the night of the 31st the engine of a passenger train on the New York, Lake Erie & Western broke a connecting rod near Hornellsville, N. Y., wrecking the cab and injuring the engineer.

OTHER ACCIDENTS.

On the 19th a switching engine on the Delaware, Lackawanna & Western road exploded its cylinder in Newark, N. J., doing some damage.

On the evening of the 22d the baggage car of a passenger train on the New York & Greenwood Lake road caught fire when near Snake Hill, N. J., and was entirely destroyed.

On the 29th a flat car loaded with cotton on a freight train on the Chicago, St. Louis & New Orleans road caught fire from a burning tree near McComb City, Miss., and four cars were burned.

This is a total of 223 accidents, whereby 30 persons were killed and 182 injured. Twenty accidents caused the death of one or more persons each; 41 caused injury, but not death, while in 162, or 72.3 per cent. of the whole number there was no injury recorded.

As compared with January, 1880, there was an increase of 161 accidents, of 19 in the number killed and of 132 in that injured. The number of accidents is the largest we have ever recorded, the nearest approach to it being in February, 1875, when there were 211 in the list.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear collisions	34
Butting collisions	13
Crossing collisions	5
	—52
DERAILMENTS:	
Broken rail	29
Broken wheel	21
Broken axle	10
Broken connecting rod	1
Broken truck	3
Loose wheel	2
Broken switch-rod	3
Broken bridge	5
Spreading of rails	2
Accidental obstruction	5
Cattle	1
Land-slide	2
Snow and ice	8
Rail removed for repairs	3
Misplaced switch	12
Unexplained	43
	—150
Broken wheel not causing derailment	12
Broken connecting rod	5
Broken axle, not causing derailment	1
Cylinder exploded	1
Car burned while running	2
Total	223

Four collisions were caused by misplaced switches; three by trains breaking in two; three by fog; one each by a a mistake in orders, by failure to use signals and by cars run out of a siding.

There were 98 accidents resulting from defect or failure of road or equipment; 13 caused directly by the elements or the weather; 8 by purely accidental obstructions, which could hardly be foreseen or prevented; 61 were due to carelessness or defective management, and 43 were unexplained. Probably many of the unexplained accidents were caused by snow.

There were 110 accidents in daylight; 91 in the hours of darkness, and in 22 cases the time is not definitely given.

A division according to classes of accidents is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	6	73	17	96
To a passenger and a freight	14	..	..	14
To freight trains	32	77	4	113
Total	52	150	21	223
Casualties:				
Killed by	10	20	..	30
Injured by	34	146	2	182
Total	44	166	2	227

This statement is probably not correct. The number of slight acidents to freight trains is doubtless far greater than to passeger trains, but passenger train accidents are very likely to be recorded, while freight train accidents where no serious damage is done are very likely to escape observation and be hardly heard of except among the train-men, unless some serious delay to traffic is caused.

The extraordinary number of accidents and the very sharp contrast with January of last year are not difficult to explain. We have before referred to the difficulties arising from pressure of traffic and inexperienced train-men, but January of this year was the severest month for many years. Intense cold and frequent snow-storms are not favorable for safety of operation, and the nature of the accident almost of itself explains the cause. There were no less than 29 broken rails, 33 broken wheels, 6 broken connecting rods and 11 broken axles—evidence not to be disputed. We have before pointed out the close connection between the weather and the number of accidents, and it almost seems as if the statements of past years of accident might be used as a meteorological record for reference hereafter. There were comparatively few fatal accidents, a large proportion being slight.

For the year ending with January the record is as follows:

	Number of accidents.	Killed.	Injured.
February	64	16	49
March	65	9	33
April	71	11	45
May	46	30	107
June	56	15	77
July	78	21	100
August	112	49	214
September	124	15	54
October	120	69	137
November	145	40	165
December	135	29	141
January	223	30	182
Totals	1,239	334	1,304
Total, same months, 1879-80	859	173	669

For the month the averages per day were 7.19 accidents, 0.97 killed and 5.87 injured; for the year they were 3.38 accidents, 0.91 killed and 3.56 injured. The average casualties per accident were, for the month, 0.135 killed and 0.816 injured: for the year, 0.270 killed and 1.052 injured.

Discussion on Steel Rails.

[Abstract of the official report of the discussion of papers by Dr. P. H. Dudley and C. P. Sandberg, at the Philadelphia meeting of the American Institute of Mining Engineers, February, 1881.]

MR. ASHBEL WELCH: Dr. Dudley has discussed the wear of steel rails under four conditions: On level tangents; grade tangents; level curves, and grade curves. Mr. Welch called attention to the weight on a wheel as affecting the requirements of hard or soft steel. In the future the weight per wheel of loaded freight trains will be 60 per cent. greater than in the past. As 60 per cent. more freight is carried over the south (east-bound) track of the Pennsylvania Railroad than over the north (west-bound) track, the number of wheels passing over both being practically equal, we have 60 per cent. more weight on each wheel on the south track than on the north. But Mr. Welch finds that the loss of metal per yard of rail, per ton carried, is 31 per cent. more on the south track than on the north. The examples were too few to deduce a law from, but Mr. Welch suggests that "within certain limits the wear of such steel rails per ton carried increases about as the 0.6th power of the weight on a wheel." The addition of 60 per cent. to the weight on a wheel may require harder steel than has been required heretofore, and that might change Dr. Dudley's conclusion, and the soft steel that has heretofore had greatest endurance may hereafter have the least.

Some years ago Mr. Welch found the wear of iron rails from Bethlehem to be 25 per cent. greater than that of steel rails rolled by John Brown at Sheffield. This is not, however, a test of relative durability, as steel will wear down to a skeleton, while iron after certain pounding "becomes unwelded and falls to pieces before it is half worn." There is little danger of broken rails with a good roadbed.

In 1863 Mr. Welch designed a rail section which was essentially that which is now the standard. John Brown & Co. refused at first to roll this rail, but did roll it in 1867, and it was laid between Philadelphia and New York. Not one of that lot has broken, though subjected to hard usage.

In 1864, Mr. Welch was chairman of the committee of the American Society of Civil Engineers appointed to consider the subject of rails, and Mr. Chanute was a member of that committee.

MR. R. W. HUNT: Mr. Hunt accepts Dr. Dudley's tests both physical and chemical as accurate, but at the same time he knows how easy it is for chemists to be mistaken. "Dr. Dudley presents a kind of steel which it will trouble Bessemer steel people to make."

Dr. Dudley deals in this paper with the wearing qualities of rails because improved road-beds and better methods at the steel works are doing away with broken and crushed rails; hence the question of wearing power becomes the all important one. But, so far as Mr. Hunt knows, the rails which on the Pennsylvania road are not breaking or crushing as much as formerly contain higher percentages of both carbon and manganese than

Dr. Dudley advises. In the judgment of Mr. Hunt, averages in such investigations are extremely dangerous unless made from an immense number of examples, taken from metal that has exactly the same history. Dr. Dudley's samples were too few for the basis of a sound theory. "It took us a long time to understand how to make Bessemer steel at all; Dr. Dudley must not expect to be able to so easily tell us how to make the best." To illustrate the danger of his averages: Among the rails taken from a level tangent, that showing the best results, has: carbon, 0.428; phosphorus, 0.127; silicon, 0.083; manganese, 0.708; while that which shows within three of the worst results, has: Carbon, 0.428; phosphorus, 0.109; silicon, 0.138; manganese, 0.870. The next to the worst had the same manganese as the best; and so in the case of the samples from the low side of level curves. The second best rail has Carbon, 0.454; phosphorus, 0.145; silicon, 0.015; manganese, 0.726; while the poorest has: Carbon, 0.497; phosphorus, 0.136; silicon, 0.032; manganese, 0.724. Mr. Hunt cannot believe that the slight difference in the chemical constituents of these rails caused the great difference in their wear. The rail makers of both this country and England are making steel rails containing much more manganese than formerly, and time only can tell how they will wear, but it must be borne in mind that the rail-makers have not put in more manganese of their own impulse. Engineers have demanded stiffer rails for their suspended joints.

"The present Troy practice is to put in enough carbon to make strong steel and enough manganese to make it roll sound; hot-straighten the rails and cold-press while the steel is yet hot." Tests are made of a four-inch ingot from each blow.

Mr. WILLIAM SELLERS: Dr. Dudley's paper presents the record of a series of investigations that are extremely valuable, and the deduction from the results noted seems unavoidable, but the tests to which it is proposed to hereafter subject steel rails should have our careful attention. We have learned that larger and larger quantities of phosphorus may be used in steel, provided corresponding changes in the chemical composition be made; and steel with high phosphorus is now considered to possess qualities which fit it admirably for use in rails. We have learned, too, that the degree of heat and the manipulations to which the ingot is subjected have an important influence on the characteristics of the product. The chemical composition has no value to the engineer, except as it affects the physical quality of the material he has to deal with, and no matter what the chemical composition, it is upon the physical qualities at last that he must rely to determine whether or not it will answer his purpose. It is his business to devise the tests which will determine whether or not the requisite quality has been produced; while the manufacturer should be left free to make such chemical combinations as shall produce this quality.

For all structural uses the engineer must know upon what ultimate strength he can rely, but it is upon ductility that he must depend for safety. High ductility, and high ultimate strength can be produced together only with the most favorable conditions of chemical combination and best mode of manufacture; therefore the requirement simply of an ultimate strength of not less than—pounds per square inch, and a ductility of not less than — per cent. would at once determine the character of steel required and the quality of it. But the capacity to bear fatigue and shock is scarcely less important, particularly in rails.

Dr. Dudley's data indicate that to establish the relation between ultimate strength and ductility would be insufficient to determine the wearing quality of rails. Mr. Sellers would suggest in addition tests for fatigue from shock, and simple bending, which last Dr. Dudley has found to bear a closer relation to the loss of metal per million tons than any of the other tests. But for a bending test Mr. Sellers would prefer a drop test to a test by slowly applied pressure, as more nearly realizing the conditions of practice.

He concludes that "to obtain the relation of ductility to ultimate strength, together with the capacity to sustain fatigue from shock, would be to attain to absolute certainty as to the quality in an engineering sense." As it is the consumer who must eventually bear all the cost of tests, it is important that the railroad companies should adopt a system of tests at once expeditious and economical. "It would seem to be sufficient to adopt a system that would be simply an indication as to the qualities de ired, without subjecting the parties interested to the cost and delay which must result from exhaustive and thorough tests. This would seem to accord with the best foreign practice as illustrated by" Mr. Sandberg's very valuable paper upon Rail Specifications and Rail Inspections in Europe. Mr. Sellers suggests the registering punch and the drop test as cheap, expeditious and accurate. He also suggests that, if the physical tests are to be supplemented by chemical analysis, a maximum limit merely should be fixed for phosphorus, silicon and manganese, leaving the carbon to be varied by the manufacturer; for it is evident that if the engineer defines the chemical composition he cannot reasonably ask the manufacturer to guarantee certain physical properties for the result.

Mr. W. R. JONES: Dr. Dudley has omitted from his analysis two very important elements, copper and sulphur. Mr. Jones cannot accept as correct any formula for making steel which omits elements of so much importance. Moreover, he cannot accept Dr. Dudley's analyses as correct till they are confirmed by the chemists of the leading steel works. He is led to this scepticism by repeated discrepancies in the analyses of the same sample by various chemists. He also doubts the correctness of Dr. Dudley's method of selecting the rails to be tested—the best of one brand and the worst of another. He finds, further, on close inspection of the paper under discussion that Dr. Dudley "has taken no notice whatever of the increased weight of cars, increased weight of locomotives, with increased speed, in his tonnage calculations." The duty to which rails are subjected [on the Pennsylvania Railroad] is fully 60 per cent. greater than before the year 1874. "So on looking over the Doctor's paper we find any number of rails which he has classed as good wearing rails, that for years have been subjected to a comparatively light tonnage, on a wheel-tonnage basis, compared to a great number of rails that he has classed as fast wearing rails and in some cases I find have had passing over them nearly twice the number of tons per month, and all on heavier wheel-tonnage." This is illustrated by a comparison of rails No. 929 and No. 937. Rail No. 929 has carbon, 0.235; silicon, 0.030; phosphorus, 0.055, and manganese, 0.300; elongation, 24 per cent. Rail No. 937 has carbon, 0.454; silicon, 0.015; phosporus, 0.145, and manganese, 0.736; with only 2 per cent. elongation. No. 937 should, according to formula, be a very bad rail, yet it has been subjected to a monthly tonnage of 747,628 tons, or 96 per cent. more than No. 929, which is classed as a good rail. The bad rail has been in the track forty months and only shows a wear of 0.05 in. in vertical section. As to tests, Mr. Jones prefers Mr. Sandberg's tests to the methods proposed by Dr. Dudley.

Mr. WILLIAM METCALF: Mr. Metcalf does not agree to the deductions of Dr. Dudley, but does not think him entirely wrong. "When we have chemical determinations accurately made we can predict almost to an absolute certainty the physical properties and value of steel from the chemical analysis. I can say that in 13 years' experience I have never found a case where a physical test and chemical analysis vary in crucible steel."

He finds Dr. Dudley's analysis "deplorably incomplete." Copper and sulphur are ignored, and these are very dangerous elements in steel. "We all know that the great friend of steel is carbon and the other elements of his [Dr. Dudley's] units are really elements of rottenness." Mr. Metcalf thinks it fair to assume that the wear of a rail would be analogous to the wear of a roll. Having had considerable experience with steel rolls he has found that soft steel would flow and bend down, and that the rolls that flowed broke off and went to pieces. Steel flows are shown in almost every case given by Dr. Dudley; yet he seems to have ignored this very important mode of destruction of rails. On general principles, soft rails seem to wear best; but making an analysis of Dr. Dudley's data, it was found that of 30 cases 12 supported Dr. Dudley's theory and 18 were against him.

[Mr. Metcalf then read quite an elaborate paper on "Why Does Steel Harden?"]

Mr. GEORGE WEBB (communicated): The Cambria Iron Co. has rolls for 90 patterns of rails, but one pattern was the standard on 32,252 miles of the 84,233 miles of track in the United States in 1879; that is, on 38.76 per cent. of the total mileage, this one form, with slight modification, was adopted as the standard. At this date the percentage is greater, for it is adopted as the standard on those lines whose mileage is now increasing at the largest rate. In frequent tests on these standard rails and angle bars, he has assumed 27½ in. between centres of 8-inch ties, or 19½ in. clear. With 19½ in. between supports, the test results have been as follows: Elastic limit, 80,000 lbs.; permanent set then, 0.0016 in.; broke at 146,000 lbs.; deflection then, 2.65 in.; elastic limit to ultimate, 54.12 per cent.

The combination of two stubs of rails, each 10⅝ in. long, ⅛ in. space between ends, two double angle-bars, four ¾ by 3¼ in. button-head, oval-neck, iron bolts and one U. S. standard nut on each bolt, resisted strain as follows: Elastic limit, 38,000 lbs.; permanent set then, 0.0024 in.; angle-bar broke in centre of length at 88,000 lbs.; deflection then, 2.50 in.; elastic limit of combination, 47.50 per cent. of elastic limit of rail; ultimate strength of combination, 60.28 per cent. of ultimate strength of rail; or with one-half of the entire weight of ordinary passenger-service locomotive on the joint of a track scantily supplied with cross ties, this combination will set one-quarter of one hundredth of an inch if properly placed and fastened.

"The designer of rails and joint fastenings should be held responsible for weight and form, based on good material well worked, and properly cared for in track. The maker should be held responsible for all defects in material and manufacture. The railway managers, engineers, and trackmasters should be held responsible for all defects in roadway, provided the corporation furnishes them with good material and plenty of means to place it and properly care for it. The rail and splice-bar maker is too often, in fact very generally, expected to furnish materials that can and will stand anything that may happen; for example, the 'drop test,' which cannot represent anything that can happen in practice, unless it be a low, unsupported joint or tie, a flat place in car wheel, a broken driving-wheel tire, or an actual derailment of a train. With about as much equity and common sense such tests are also required of wheels and axles; and these drop tests are required to be made on clear openings, three feet between supports, when no one in the United States at all familiar with the subject would build a railway even for hauling saw logs, at speed of six miles per hour, with any such space between cross ties.

"Any one who will take the trouble to watch effects of a passing train on the best cared-for track will observe a slight wave in the metals between the ties in advance of each heavily-laden wheel. If the joint occurs in the *trough* of this wave, the rail-ends are shut and depressed when the wheel passes over them. On the other hand, if the joint occurs on a stiffly-tamped joint tie, it is on the *crest* of the wave—the joint is opened and the exposed end of the metal is barbarously pounded by every passing wheel. Taking another view of this subject, the double angle-bar, notched, and well spiked to two well-tamped 10-inch ties, may be considered as a bridge sustained by two adequate abutments. But who will ever contend for a bridge supported at the middle and free at both ends?

"May 26, 1876, I most thoroughly tested the 'resistance to strains,' values of the double angle splice-bars, compared with the double plain fish-plate, and the combination of one plain fish-plate with one angle bar. The results were as follows:

	Elastic limit.	Ultimate strength.
Double angle-bar, assumed standard	1.0000	1.0000
Double-plain fish-plate	0.3333	0.6666
One angle-bar, combined with one fish-plate	0.4002	0.6920

The low result of the last was to be expected. The fish-plate failed and the combination was dissolved. It would seem incredible that any one at all familiar with the distressing effect on any metal, of punching with a *square* punch, would expect a square-necked bolt would be preferred to the oval-neck bolt now universally used on American railroads.

"Respecting the decadence in quality of iron rails I was near at hand when and where it began in this country. A gentleman of wide reputation as an engineer and railway president concluded he was a court of last resort on any question affecting railways. Though he had for many years been buying the "good old-fashioned iron rails" that we now hear so many elegies about, and which were made for him by men of long experience, who had the same reasons for maintaining reputation for honor and integrity as he had; and though he *knew* nothing whatever about puddling, piling, or rolling rails, he decided to fix a regular formula for preparing, piling, and working the iron for his rails. He did so, and made the requirements absolute. To see that they were thoroughly carried out he sent to the mill an "Expert" in the person of a gray-haired Ph.D., LL.D., and M.D. The mill manager was a thoroughly honest man, and he protested that such practice would produce rails of horrible quality, but he said he would make them that way if the Ph.D., etc., insisted on it. Of course the mill manager at once became a 'Suspect,' and his every move was watched. The rails were completed to the entire satisfaction of the expert, and they endured about three months' service on a line with but moderate traffic. There was but little left of them but ashes; but out of those ashes arose clouds of 'Experts,' who have since benumbed and terrified iron railmakers with 'character of ores required'—'dry fixes' and 'wet fixes,' 'puddling,' 'boiling,' 'preheats,' 'reheats,' 'edge piles,' and 'flat piles,' until the railmaker, in despair, has never since tried to use his experience and judgment, but he has made all his work after some 'Expert's' theory, whether or not the specifications in that particular case required it; for he expected at last some 'Expert' would appear to inspect the rail and cross-examine him as to which theory they had been made under; for,

"'He never could wield a carnivorous pen
Like any of those intellectual men.'

"Meantime the old 26 to 28-ton engines, with extreme weight of about 8,000 pounds on a point, had given way to engines with double that weight. The 16,000 lbs. freight cars, with maximum load of 20,000 lbs., had given way to 20,000 lbs. cars with 40,000 lbs. weight, and the old-fashioned passenger cars had given way to trains of palace cars, *each car of which weighs more than the old-time engine* weighed; and the speed of all trains had about doubled. The railway managers and engineers strengthened their bridges, but the rail was expected to behave like its old-fashioned predecessor, though it was abused and tortured up to and beyond the limit of atomic cohesion of any iron, even though it and its maker had not been tortured by 'Experts.' Reports from all the leading older rail mills in this country confirm me in the belief that every one of the 'good old-fashioned iron rails,' so often referred to now, was made without any specifications as to material and mode of manufacture, and it was shipped, in most cases, from the mill under the makers' inspection, on his actual experience in treating metals, and on his honor as a business man."

Mr. Webb thinks that the makers of steel rails hail with joy the new process for bringing the phosphorus units in their make of rails to the proper standard, that is the improvement in maintenance of way. It beats all the Reese and Gilchrist-Thomas processes.

"Porosity" and "pipings" in steel ingots are entirely distinct conditions. Their causes are widely distinct. The first is due to temperature at which the heat is poured, and to the carelessness in mode of preparing for and in pouring. Pouring the high phosphorus units steel doubtless requires most care. The porosity of ingot end doubtless caused a bad end to the rail; unless, by the most rigid scrutiny, it was sawed off inside of the porous part. But the selection of the proper point for sawing had no reference whatever to the chemical composition of the rail. No matter what causes knots to grow and splits to occur in timber, the mechanic must select the clear, sound stuff to make a good panel door, or good flooring; so in a good rail. The makers have always known this, and at their meetings this question, above all others, has been discussed, viz.: Whether their mill managers and inspectors were really careless in scrutinizing the ends, or were the railway managers, engineers and trackmasters at fault in not vigilantly caring for the joints, surface, and alignment of their tracks? The recent testimony from so high a source seems to settle this question. Being their witness, they will not cross-examine him.

Low phosphorus units steel will have the most pipings, and as a consequence, more of those black pits and thin fins so terrifying to railroad men. The contact of the low-phosphorus-units-molten-metal steel with the high-phosphorus-units metal in the cast-iron mold seems to be the cause of these pipings. These pipings can probably be prevented by using proper material for a good coat of facing on the inside of molds, supplemented by a powerful pressure on the molten metal.

Mr. Webb then explained the tests made regularly at the Cambria Iron Co.'s works, and added: "I have digressed from the main subject in order to explain why I think it difficult, if not almost impossible, to fix rigid lines between which we must travel. Ordinary Bessemer steel of 65,000 ultimate strength can be readily nicked by dropping on it the blade of a common-sized pocket knife. Unless the track is kept in perfect surface and alignment, and no flat wheels are allowed under cars or engines, and all engine tires are removed as soon as the flanges become the least sharp, I think Dr. Dudley's soft steel in a rail must bend and be deformed very rapidly, unless by the pressure system it be made dense.

"It seems to me the railway companies and the railmakers should unite and at once and forever decide by actual test (which shall resemble real service) just what material and mode of make produces the best rail."

He suggests a scheme for testing as follows: "The track would be 300 feet in circumference. On it can traverse 60 ordinary car-wheels at once, each loaded with 5 tons—total, 300 tons. At speed of thirty miles per hour a service of about seventy millions of tons could be developed in twenty days of 22 hours each. At the end of that the wheels, axles and journal-bearings would probably be worn out. A new set can then be applied, and the ultimate endurance of that set of rails under that load per wheel, at that speed, can then be determined. The track-bed being permanent, all rails have the same chance; for it is intended that the whole *machine* is to be flexible, each arm is only hung at hub and at rim to prevent end thrust on the axles, and the rim will be in sections, each wheel having its portion as a truck; so that no rail, wheel, axle or journal-box can possibly escape its share of duty. It will be a reliable test of the endurance of wheels, axles and journal-boxes, and of the power required, by comparison, of the various lengths and diameters of journals under same weight and at same speed. As the propelling power is to be communicated through a friction wheel, whose shaft-journals are sustained in their boxes by levers and counter-weights, the comparative values of lubricants and journal-bearing metals can be accurately measured. A set of each kind of rails should be tried under speeds of say 10, 20, 30, and 40 miles per hour. If any doubt about fairness of any test should occur it can readily be duplicated, for the surrounding conditions would always be the same. The series would probably require a year, and the expense, after selling scrap, ought not to exceed $100,000."

Dr. WILLIAM KENT: He suggests that the Bessemer companies decide that the 10 standard sections shall be the Sandberg sections. Dr. Kent concludes from examining Dr. Dudley's paper that: 1. Within the limits of nearly the whole range of the chemical and bending tests of these 64 rails, the wearing power of these rails bears no relation at all to carbon, to phosphorus, to silicon, to manganese, to phosphorus units, to bending-weight or to deflection. 2. The difference in wearing power of these 64 rails was not due to carbon, phosphorus, silicon or manganese, or to any combination of these elements, but to some cause or causes to which Dr. Dudley's investigation furnishes no clue, but which probably have far more influence than all the four chemical elements named by Dr. Dudley. 3. The railroad companies must abandon for the next ten years the attempt to limit rail manufactures to a certain prescribed chemical analysis, and should inaugurate another investigation to endure ten years and to reach much farther than Dr. Dudley's investigations have gone. 4. Dr. Dudley's experience should be a lesson to all consumers of steel who attempt to prescribe chemical and physical specifications, often incompatible. Taking Dr. Dudley's specifications and applying them to the 64 rails treated in his analysis, we should reject 61, and one of the three accepted would be classed by Dr. Dudley as a bad rail, while 30 of his good rails would be rejected. Each of the 61 rejected rails would fall short of the specified requirements in an average of 3.44 particulars. Further, selecting the 18 worst rails of Dr. Dudley's tables, they show a loss of metal, per million tons carried, greater than the loss of the 32 bad rails by 29 per cent., while in bending-weight, deflection and silicon the 18 rails are slightly better than the 32, and in the other specifications slightly worse. But one would expect a lot of rails having 29 per cent. worse wearing power than a larger lot which included them to differ very decidedly in average analysis and bend-

ing tests from the average analysis and bending tests of the larger lot. The actual deviation is so slight that Dr. Dudley himself could not tell, if he saw only the results of the tests, which lot had the greater wearing power. Comparing the 18 worst rails with the other 13 rails of Dr. Dudley's 32 bad rails (rejecting rail No. 920) we find the 18 worst rails to be over 98 per cent. below the 13 bad rails in wearing power, while their analysis and bending tests are nearly alike. By plotting the results of Dr. Dudley's investigations no clue can be got to a law of relation between the variables considered and the wearing power. There is an evident law of relation between the phosphorus units (not included in his specifications) and the bending weight. The conclusion naturally drawn by Dr. Kent from these and other obvious discrepancies between Dr. Dudley's formula and theories, and the tabulated results of his investigation, is that Dr. Dudley must retrace some of his steps and start on another path.

Mr. FREDERICK G. FIELD, of London (communicated): There would be no difficulty in rolling rails now with a fishing angle of 22°, but it would cause the edges of the flange to run out very thin, and weaken the ordinary fish-joint. With a flat fishing angle care must be taken to fit the plate accurately. An elaborate account of rejected rails involves a needless amount of book-keeping. The drop test of one ton falling 20 feet is too severe for a 56-lb. rail; but the drop test is the proper one for rails. Chemistry may be necessary for the blooms. Mr. Sandberg's new section for a 56-lb. rail varies disadvantageously from his other new sections. The web is too thick. The 50-lb. or the 60-lb. section will be found more advantageous to buyers.

Mr. R. H. SAYRE: Mr. Sayre in a brief letter suggests that the American Institute of Mining Engineers and the American Society of Civil Engineers should unite in the adoption of templates for rails and fish plates.

Mr. AUGUST WENDEL: After simplifying Dr. Dudley's formula it will be *one* good theory to work by. Accepting Dr. Dudley's reasoning from averages the silicon element has no importance. His results as to manganese seem erroneous. Ordinarily, manganese is a function of the carbon and should not be introduced into a formula for daily working as an independent coefficient. While not deprecating chemistry, he would keep it in its proper place. Let the chemist look after the pig metal, and apply common sense in avoiding expenses.

Dr. T. EGGLESTON: This discussion is taking the wrong direction and will prove that the chemist will have to leave this problem to the physicist for solution. We must consider the law of fatigue and refreshment of metals, and that every blow of the wheels is attended by a physical effect. The copper cannot be disregarded. Another trouble is from *bubbles* in steel. A bubble in a metal is never rolled out, and will cause trouble. All these matters must be considered—but physical research is the way to most knowledge of steel now.

Mr JOHN W. CLOUD: We should study the physical properties of steel in relation to its wearing power, and ask the makers to give us the requisite physical properties and leave the chemistry to him.

The evidence that softer steel does give greater wear in rails is conclusive. At Altoona careful examinations have lately been made of locomotive tires, and from one to two inches difference has been found in the diameters of the tires of wheels on the same axle. Invariably when these two tires are put in the lathe it is found that the tire the most worn is the harder. This is established by the measurements which have been taken, though the results are not yet ready for publication. Therefore, Mr. Cloud is quite convinced that Dr. Dudley is right in claiming greater wear for the soft rails. By making careful physical tests, specifications can be prepared for all the steel rail sections used by the Pennsylvania Company, and Captain Jones and those on his side can make the rails of what they please, if they give them the requisite physical properties.

Mr. JACOB REESE: Dr. Dudley is evidently on the right track. What the steel men want to get at is how to produce the best rail for the least money, and to get the longest wear that can be had for a rail. This investigation should be turned not to increasing the life of a rail by increasing its hardness, but to increasing its life by increasing its tensile strength, and that will be done by increasing the carbon and decreasing the other metalloids.

Dr. DUDLEY (closing the discussion): Referring to discrepancies in analyses of one sample by various chemists, Dr. Dudley said that it is well known to steel makers that the proportions of manganese are different in different parts of the same ingot. This is due to the incomplete mixture of the spiegel. The physical tests and chemical analyses of the samples were all made before anything was known of the service to which they had been subjected or of the loss of metals, so there could have been no bias. As to sulphur and copper the best information attainable when he began the investigation was united in the notion that they had little effect on the wearing power of the steel; therefore he had not taken the time to test for them. "There has been considerable trying to prove a law by the exception. Individual rails have been taken out and made an example to teach us on all points. This is not logic. It is not a thing that should carry weight." It has been said that we pay no attention to the flow of the metal. The effort has been to determine the loss of metal by wear, and not its change of form or place. It may flow, but it is still there.

The Platform of the Anti-Monopoly League.

The following resolutions, passed at the meeting held in New York, Feb. 20, under the auspices of the Anti-Monopoly League, may be regarded as the formal statement of the objects of that organization:

Resolved, That it is the duty of citizens everywhere to organize anti-monopoly leagues, and endeavor to secure, among others, the following specific results:

1. Laws compelling transportation and telegraph companies to rate their charges upon "cost and risk of service," instead of the new theory enunciated by them—"what the business will bear."
2. Laws to prevent pooling and combinations.
3. Laws to prevent discrimination against any citizen or class of citizens on public highways.
4. Railroad Commissions or Courts, state and national, to give effect to laws which are, or may be placed, upon the statute-books.
5. Laws making it the duty of public law officers to defend a citizen's rights against injustice by powerful corporations.
6. Laws to prevent taxing the public to pay dividends on watered stock.
7. Stringent laws against bribery, including a prohibition of free passes.
8. Laws enacted by Congress enforcing the provisions of the first article of the Constitution, to regulate commerce among the several states, fixing maximum rates to be charged by corporations for labor, service, or the use of property.
9. A liberal policy toward our water ways which, during the season of navigation, are potent in preventing exorbitant charges by corporate monopolies.
10. Laws providing for the restriction within proper limits of corporate powers and privileges generally, and for the protection and elevation of the masses.

Resolved, That we view with alarm the attempts of monopolists to control our courts and the press, which, with our schools, are the chief bulwarks of our institutions; that it is the duty of every citizen to encourage those journals which are free from corporate influence and which advocate and sustain the people's rights.

Resolved, That the era of sentimental politics is over; that the right to earn a living and enjoy the fruits of honest industry is now up; that the bread and meat and fuel of the masses shall not be taxed to pay dividends on a fictitious cost of constructing public highways, and thus swell the already bursting coffers of men who "recognize no principle of action but personal or corporate aggrandizement."

Resolved, That, for the attainment of these objects, "we pledge our lives, our fortunes and our sacred honor," and we will organize and work until they are secured.

RAILROAD EARNINGS IN JANUARY.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1881.	1880.	Inc.	Dec	P. c.	1881.	1880.	Increase.	Dec.	P. c.	1881.	1880.	Inc	Dec.	P. c.
						$	$	$	$		$	$	$	$	
Ala. Gt. Southern	290	290				56,991	55,401	1,590		3.1	197	191	6		3.1
Bur., Cedar Rap. & No	564	492	72		14.6	167,750	184,317		16,567	9.0	297	374		77	20.7
Cairo & St. Louis	146	146				33,637	22,821	10,816		47.4	230	156	74		47.4
Central Pacific	2,580	2,350	230		9.8	1,498,000	1,200,614	297,386		24.8	581	511	70		13.7
Chi. & Alton	840	840				487,890	524,055		36,165	6.9	581	624		43	6.9
Chi. & Eastern Ill.	220	159	61		38.4	125,455	72,466	52,989		73.6	552	409	143		35.0
Chi., Mil. & St. Paul	3,650	2,182	1,468		67.3	991,700	764,298	227,402		29.7	272	350		78	22.3
Chi. & Northwestern	2,770	2,289	481		20.9	1,222,250	154,632	67,618		5.9	441	504		63	12.5
Chi., St. P., Minn. & O., East Div	310	260	50		19.2	128,555	105,405	23,150		30.9	415	405	10		2.4
St. P. & S. C. Div	620	420	200		47.9	111,731	88,422	23,309		23.5	180	211		31	14.8
Cin., Ind., St. L. & Chi	380	300				171,466	155,697	15,769		10.1	572	519	53		10.2
Cin. & Springfield	81	81				74,533	69,899	4,634		6.6	920	863	57		6.6
Cleve., Col., Cin. & Ind	391	391				299,903	312,603		12,700	4.1	767	799		32	4.1
Cleve., Mt. Ver. & Del.	144	157		13	8.3	32,519	34,192		1,673	4.9	251	218	33		15.1
Denver & Rio Grande	551	337	214		63.5	307,476	124,893	182,583		146.2	558	371	187		50.4
Des Moines & Ft. Dodge	84	84				24,967	18,779	6,188		32.9	297	224	73		32.9
East Tenn., Va. & Ga.	270	270				108,517	111,065		2,548	2.3	402	411		9	2.3
Flint & Pere Marq.	299	295	4		1.4	135,378	109,992	25,386		23.1	453	373	80		21.6
Gal., Har. & San Antonio	233	215	18		8.4	116,768	103,140	13,628		13.2	501	480	21		4.4
Grand Trunk	1,404	1,273	131		2.4	759,528	730,066	29,462		4.0	581	573	8		1.4
Great Western	526	526				359,478	351,244	8,234		2.3	683	668	15		2.3
Hannibal & St. Jo	292	292				153,067	176,079		23,012	13.1	524	603		79	13.1
Houston & Tex. Cen.	580	516	64		12.4	359,706	319,041	40,665		12.7	620	618	2		0.3
Ill. Cent., Ill. lines	918	873	45		5.2	477,799	467,449	10,350		2.9	520	535		15	2.8
Iowa lines	402	402				122,673	127,184		4,511	3.6	305	316		11	3.6
Ind., Bloom. & West.	212	212				89,485	79,673	9,812		12.2	422	376	46		12.2
Ind., Dec. & Springf.	153	101	52		51.5	40,279	13,314	26,935		202.7	163	132	31		22.8
Int. & Gt. Northern	594	526	68		12.9	181,463	159,543	21,920		13.7	305	303	2		0.6
Lake Erie & West	362	308	54		17.5	105,178	49,494	55,684		112.5	291	161	130		80.7
Little Rock & Ft. Smith	165	165				55,800	49,800	6,000		12.0	338	302	36		12.0
Louisville & Nashv.	1,837	1,107	730		66.3	808,010	674,455	133,555		19.8	440	609		169	27.9
Memphis & Charleston	292	292				111,842	129,265		17,423	13.5	383	443		60	13.5
Memphis, Pad. & No.	115	115				18,897	19,328		431	2.2	164	168		4	2.2
Mobile & Ohio	506	506				218,243	250,116		31,873	12.7	431	494		63	12.7
Nash., Chatta. & St. L	467	454	13		2.8	178,143	205,634		27,491	13.4	381	453		72	15.9
Northern Central	326	326				386,156	334,494	51,662		15.4	1,185	1,026	159		15.4
Northern Pacific	722	644	78		12.1	109,805	81,593	28,212		34.6	152	127	25		19.7
Ogdensburg & Lake Cham	122	122				24,902	30,202		5,300	17.6	204	248		44	17.6
Paducah & E'town	185	185				42,402	36,900	5,502		13.9	256	199	57		13.9
Pennsylvania	1,902	1,872	30		1.6	3,189,215	3,083,551	105,664		3.4	1,677	1,649	28		1.7
Peoria, Dec. & Evansville	192	126	66		52.4	40,607	14,211	26,396		188.4	211	113	98		86.7
St. L., Alt. & T. H., Main Line	195	195				101,774	96,922	4,852		5.0	522	497	25		5.0
Belleville Line	71	71				67,684	56,217	11,467		20.4	953	792	161		20.4
St. L., Iron Mt. & So.	685	685				559,400	555,983	3,417		0.6	817	812	5		0.6
St. L. & San Francisco	627	506	121		23.9	212,435	195,695	16,740		8.5	339	387		48	12.4
St. P., Minn. & Manitoba	866	656	210		32.0	254,187	180,239	73,948		41.1	294	275	19		6.9
Wabash, St. L. & P.	2,487	2,309	178		7.7	811,617	928,603		116,986	12.6	326	402		76	18.9
Total, 47 roads	31,548	26,923	4,638	13		15,935,261	14,608,936	1,622,955	296,680		505	543		38	7.0
Total increase			4,625		17.2			1,326,275		9.1					

Position of Brake Shafts and Ladders on Freight Cars.

[Circular of Committee of Master Car Builders' Association.]

No. 113 LIBERTY STREET, NEW YORK, January 1, 1881.

To the Managers, Superintendents, Master Mechanics, and Master Car-Builders of Railroads:

The attention of the Master Car Builders' Association was called, a few years ago, to the fact that the brake shafts were not placed on the same side on all freight cars. The consequence is that when two cars having them on opposite sides are brought together, to be coupled, the brake wheels are liable to come in contact with each other and be broken, or else must be removed, which consumes time, and it then often happens that in replacing them they are insecurely fastened, and *many accidents* have happened and *lives been lost* by the wheels becoming detached while train-men were applying the brakes. Injuries to men also occur when the brake wheels, on two cars adjoining each other, are on opposite sides of the cars, and which therefore come near or in contact with each other and thus crush the hands of the men.

For these reasons the Car Builders' Association, after fully discussing the subject a few years ago, adopted a resolution, recommending that brake shafts should always be placed on what is *the left-hand side of the centre of the car*, to a person standing on the track facing the end of the car, as indicated by the engraving herewith, and placing the brake shaft as near as possible in a straight line with the top end of the lever, so that the top connecting-rod and the chain may pull in a straight line from top of lever and the brake-shaft.

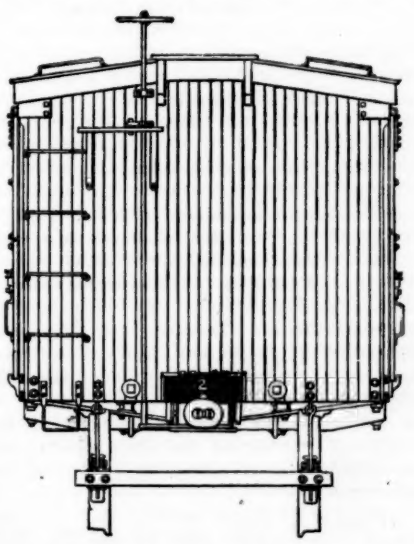
The reason for placing the brake shafts in this position rather than on the opposite side is, that in case of any of the brake attachments giving way, when a person is exerting his strength in applying the brakes, the effort of doing so would, in case the shaft is on the left side, throw him toward the roof of the car instead of away from it.

The main object to accomplish, though, is *uniformity*, and it is believed that there are now more cars in the country with the brake-shafts in the position recommended than in the opposite one.

Since the resolution referred to was passed, some companies have changed the position of their brake-shafts, and very generally its recommendations have been followed in the construction of new cars.

The object of this circular is to call your attention to the subject, and if you have not already done so, to try to induce you to adopt the recommendation of the Master Car-Builders' Association, and to venture to express the opinion that doing so will be the means of *saving the lives and limbs* of the men you employ, and it will *protect the property of your company from injury.*

In order to enable the committee to know to what extent the recommendation of the Association has been adopted, will you oblige them by filling up the enclosed circular and



forwarding it to the chairman, and also state whether you consider the side or the end of a freight car the best position for the ladder, and your reason for your preference.

C. A. SMITH, No. 113 Liberty street, New York.
C. E. GAREY, Master Car Builder of the New York & Harlem Railroad, Morrisania, N. Y.
J. N. MILEHAM, Master Car Builder New York, Lake Erie & Western Railroad, Jersey City, N. J.

.....1881.

Name of road.....
Number of cars, approximately, with brake-shaft on left-hand side.....
Number of cars, approximately, with brake-shaft on right-hand side.....
I consider the.....as the best position for freight-car ladders, for the following reasons:

Hear?

Railroad men down East think that they have been unduly harrassed by examinations for color-blindness and defects of sight. But now a new professor rises to remark that railroad companies ought to have all their train-men and signal-men carefully examined for defects in hearing. When they are loading the camel, it does seem as if everyone tried to pile on that last straw.

RAILROAD GAZETTE

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CONDUCTED BY

S WRIGHT DUNNING AND M. N. FORNEY.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

THE PENNSYLVANIA RAILROAD REPORT.

The report of the Pennsylvania Railroad Company for 1880, an abstract of which we publish this week, gives a record of the work, earnings, and expenses of a system of 5,357 miles of railroad worked by this company, besides 66 miles of canal; and, briefly, of several other railroads in which it has a large interest, but which are worked by the corporations owning them. This system of roads extends from New York, Philadelphia and Baltimore in the East to Cleveland, Toledo, Chicago, St. Louis, Louisville, Indianapolis and Cincinnati in the West—that is, it covers the part of the country where population, production and traffic are heaviest. Its mileage is a considerable share of the total of the United States, but its earnings are a much larger proportion (in 1879 nearly 12 per cent.) and its traffic a still larger proportion. This report, therefore, gives us at once a very large portion of the railroad history of the year.

We will begin by examining the aggregate traffic earnings and expenses of the whole system worked whose length is given above, for a series of years. These were as follows:

	Passenger miles.	Ton miles.	Gross earnings.	Expenses.	Net earnings.
1874			$82,93[illegible]351	$ 9,42[illegible]645	$21,515,706
1875	562,514,464	3,355,797,075	58,[illegible]96,866	36,574,141	21,522 72[illegible]
1876	8 2,[illegible]62,6[illegible]9	3,591,862,5[illegible]8	61,561,211	39,495,737	22, 65,474
1877	543,097,170	3,64[illegible],222,819	54,150,720	31,022,329	20,137,391
1878	540,000,690	4,215,907,808	55,426,963	33,611,[illegible]34	21,815 929
1879	583,776,686	5,384,194,474	60,[illegible]02,576	35,039,795	24,722,781
1880	704,571,071	5,719,[illegible]03,065	70,764,062	42,1[illegible]9,485	28,584,577

These are truly enormous figures. There are but two or three states in the country all of whose railroads together have so large a traffic. Covering so wide a field and so great a number of lines, the system may reasonably be supposed to indicate the general course of railroad business north of the Potomac and the Ohio and east of the Mississippi.

And first as regards traffic. The passenger traffic, it appears, was 20.7 per cent. larger than in 1879, though this traffic heretofore, on this as on other roads, has been comparatively stationary (with the exception of the Centennial year). With that exception there had never before been an increase of more than 44 millions of passenger miles in a year; last year the increase was 121 millions.

But when we turn to the freight traffic we find that the increase last year was comparatively insignificant, though it was the most prosperous year, perhaps, in the history of the country, and though for two years previous the increase had been enormous. From 1877 to 1878 this business increased one-sixth; from 1878 to 1879 it increased one-quarter; from 1879 to 1880, only 7¼ per cent., which is less than the rate of increase from 1875 to 1876, when business was prostrate. If we compare the progress from 1879 to 1880 with that of the New York Central and the Erie during the year ending with September, 1880, we find that the percentages of increase of the two kinds of traffic on the three roads were, respectively:

	Penna.	Erie.	New York Central.
Passenger	20.7	21.0	13.7
Freight	7.2	9.7	10.0

Thus the *whole Pennsylvania system* had an increase in passenger traffic at about the same rate as the Erie's and one-half greater than the New York Central's, but it had a smaller rate of increase in freight traffic than either of the others. However, the Pennsylvania system is something vastly larger than and greatly different from the trunk lines here cited, and they are brought together rather to illustrate by their aggregate traffic, which forms so large a portion of that of the country, than for comparison with each other. For the latter the Pennsylvania Railroad Division of the Pennsylvania system, including 1,120 miles of road, will serve best. On this the increase was 26.4 per cent. in passenger and 7.6 per cent. in freight—a larger passenger increase, but a smaller freight increase than on either of the other roads, for which latter we do not find it easy to account, unless by the fact that the calendar year 1879 was a better one for traffic than the fiscal year ending with September, which may very well be. But the assumptions that we have made of a great increase on the Pennsylvania because of the greater activity in the iron manufactures would seem not to be supported, unless there has been a decrease in other directions, as there certainly was in grain.

The increase in the earnings of the whole system was 17.2 per cent. This increase in earnings was not due wholly to the increase in traffic, but to a very considerable extent on an increase in the average freight rate, amounting on the lines east of Pittsburgh and Erie to about one-ninth, or to 0.092 cent per ton per mile. How important this advance was may be seen by the fact that the freight earnings from the traffic of 1880 at the rates of 1879 would have been $5,262,000 less than they actually were, and the net earnings would have been smaller instead of greater. For a portion of the increase in the rate was absorbed by an increase in the expenses; while the rate increased 0.092 cent per ton per mile, on the lines east of Pittsburgh the profit increased but 0.034 cent.

This is a striking illustration of the vast importance of maintaining rates. With the higher working expenses now ruling, railroad wars such as prevailed in 1879 and previous years would be more fatal than they were then.

The working expenses of the whole system increased nearly one-fifth, which is much more than in proportion to the traffic or even the gross earnings. The report especially states, however, that the expenses do not include expenditures for new construction. It says:

"It may be proper at this point also to correct the impression, prevailing more strongly abroad than in this country, that the revenues of your company, to an unreasonable extent, are devoted to new construction work, and such outlays charged to expenses. This, the shareholders may be assured, is not the fact. The cost of all new construction work not properly chargeable to the expense account is each year added to your capital account, the funds for the purpose, for the last two years, having been obtained largely by the sale of such securities owned by the company as it was deemed wise to dispose of."

There have been, however, such variations in the maintenance expenses as to throw upon a year when earnings were large the renewals due to traffic in previous years—something which cannot be prevented entirely; but which may be varied at will to a great extent. For instance, on the Pennsylvania Railroad Division the consumption of rails was 65 per cent. and of ties more than 40 per cent. greater in 1880 than in 1879, and nearly *three times* as much of each were used in 1880 as in 1877, when the earnings were very small. For four successive years the aggregate consumption of rails and ties for maintenance on all the lines east of Pittsburgh and Erie was:

Year.	Tons rails.	No. ties.
1877	11,192	705,409
1878	13,372	674,715
1879	16,475	930,471
1880	17,221	1,164,937

This great increase in rails on the Pennsylvania Railroad Division last year is nearly balanced by a great decrease on the Philadelphia & Erie, on which the consumption was not half as great as in 1879, and at the rate of but 5.5 tons per mile of track, which, however, on all-steel tracks is probably as much as the average depreciation. On the Pennsylvania Railroad Division the renewals were at the rate of 6.0 tons per mile of track, against 3.7 tons in 1879, 2.8 in 1878, and 2.3 in 1877.

The roads west of Pittsburgh laid somewhat fewer steel rails in 1880 than in 1879, but 12,325 tons of rerolled iron was laid in 1880, while none was reported laid in 1879. The increase in the consumption of these materials, however, could have had but a comparatively slight effect on expenses.

Turning to the earnings, traffic, etc., of the lines east of Pittsburgh and Erie, which alone are treated with much fullness, we find that there was an increase of 21.8 per cent. in passenger traffic and of 19.1 per cent. in passenger earnings; of 7.6 per cent. in freight traffic and 21.1 per cent. in freight earnings. There was an increase of $667,712 in the interest and rentals of the Pennsylvania lines; the earnings of the leased New Jersey lines increased nearly 18 per cent., but the increase in their expenses was 26.4 per cent., so that the increase in their net earnings was less than $50,000, and the net loss on the lease was $1,035,309, which is $95,420 more than in 1879. The very considerable gain in the net earnings of the Philadelphia & Erie (42.4 per cent.) all went to the lessor as rental. The cash receipts for interest on the company's enormous investments in the securities of other railroads, etc., were $2,903,670, which is $792,736, or 37.6 per cent., more than in 1879. The total balance after paying all interest and rentals and other necessary charges (for some of which the company receives the securities of guaranteed lines) was $7,638,569, which is 11.9 per cent. on the capital stock. The dividend paid amounted to 7 per cent., and a balance of $2,817,655 was carried to credit of profit and loss, besides nearly $800,000 realized from old accounts and the profit on sale of securities.

The report speaks of its policy in declining to divide the whole surplus of net earnings as justified by the desirability of strengthening the company so that "a proper reserve shall be held to provide against * * * periods of depression, so that a uniformity can be maintained in its dividends." This is certainly prudent policy in the case of a company like the Pennsylvania, which has to pay rentals, and sometimes guaranteed interest, for some thousands of miles of railroad which it does not own, and which in very bad times may result in a net loss instead of a profit to the lessee.

JANUARY EARNINGS.

Our table contains statements of the January earnings of 47 railroads, having this year in the aggregate 31,548 miles of road, which is 17.2 per cent. more than they worked in January of last year. These 47 roads earned this year $15,935,261, which is 9.1 per cent. more than they earned last year, and their average earnings per mile of road *decreased* from $543 to $505, or 7 per cent. Of the 47 roads, 13 have smaller total earnings this year, and 18 smaller earnings per mile of road. Three of the roads that have smaller total earnings have a greater mileage than last year, and some of the roads that have a very large increase in mileage have comparatively a very small increase in earnings. Still, in view of the very large earnings and the unobstructed traffic last year, this year's gross earnings are, in the aggregate, very satisfactory. With net earnings this can hardly be said. The weather has greatly increased the expenses on many roads, and higher prices of labor and materials had already increased them considerably over last year. Probably a table of net earnings would be quite unsatisfactory to those who have calculated that henceforth railroad profits would grow larger year by year and month by month, though except under extraordinary circumstances they were larger than in any previous January for many years, except in 1880. There has been a very satisfactory activity in traffic generally when not prevented by the weather, and in some important items of traffic the movement has never been so great before. The shipments of grain and flour from the great Northwestern markets have been especially heavy, notwithstanding their lighter receipts, indicating that there is, this winter, much less disposition to hold till navigation opens than there was last year. This tends to leave but a light stock in the Western elevators when the lakes open, and perhaps this will tend to make the opening lake rates lower than usual. But it will be a good thing for the railroads to have secured this traffic in the winter, for in this way they have obtained remunerative rates on it, and even if they should get just as much freight after the navigation opens, they certainly will not make so much on it.

The roads which show a decrease in receipts last

January are all, with the exception of the Ogdensburg & Lake Champlain, Western and Southern roads, the other two furthest east having their eastern terminus in Cleveland.

Of eight roads south of the Ohio and east of the Mississippi, four have smaller earnings and five smaller earnings per mile, and the Southern roads west of the Mississippi show small increases in earnings except where they have increased mileage, like the Houston & Texas Central and the International & Great Northern. The reduction in earnings of these roads cannot be charged to the weather, probably, though bad roads in the South may have an effect on traffic something like blocked railroads in the North.

Seven railroads in the list with, this year, 4,831 miles, get a considerable portion of their earnings from through freight between the East and West. All these but one show a small increase in gross earnings, which in the aggregate amounts to a little less than 4 per cent., their increase in mileage (which, however, can have increased earnings only a trifle) being 3½ per cent. The absence of the New York Central from the roads reporting greatly lessens the value of this comparison of roads with trunk-line traffic. The rates on east-bound freight were lower this year, those on west-bound the same. The greater activity of local traffic and of travel have probably had most to do with increasing receipts. The greater working expenses (aside from the extraordinary ones caused by snow), have doubtless made the profits on the through roads smaller than last year. The only one that has reported expenses (the Pennsylvania, which has one-half more earnings than all the other six in our table) shows net earnings smaller by 11.7 per cent.

Notwithstanding the average decrease, there are some roads that show a very large increase in earnings per mile. These, however, almost without exception, have completed roads since last year, which give them a through traffic, more or less important, which they were entirely without last year. Thus the Denver & Rio Grande, whose earnings per mile have increased 50 per cent., last year had no line to Leadville; the Lake Erie & Western, which was not opened through last year, gains 81 per cent. and still has light earnings; the Peoria, Decatur & Evansville, extended so as to have additional through connections, gained 87 per cent. in earnings per mile, leaving it, however, with very small ones, only four of the 47 roads having smaller ones this year, while last year it was quite at the foot of the list with $113 per mile. There are, however, some large increases not to be accounted for in this way, as 47½ on the Cairo & St. Louis, 35 per cent. on the Chicago & Eastern Illinois, 33 on the Des Moines & Fort Dodge, and 21½ on the Flint & Pere Marquette.

The vast Wabash property is now not so much different from what it was last year but that comparisons may be made with advantage. With 7.7 per cent. more road it earned 12.6 per cent. less money, and its earnings per mile were 18.9 per cent. less. This road has a very varied traffic, a large portion of it being properly Western, and affected by the causes that affect the roads west of Chicago and St. Louis, and another large portion being through, and affected by such causes as affect the Lake Shore, the Cleveland, Columbus, Cincinnati & Indianapolis, the Ohio & Mississippi and the Eastern trunk lines. Its earnings were reduced last January by the effects of the passenger war on travel between Chicago and St. Louis, Chicago and Kansas City and between Toledo and Western cities. Last year in January, however, it had no line from Chicago to St. Louis and Kansas City, and its line from St. Louis to Council Bluffs had been so recently opened that it probably had but begun to develop its traffic.

Several roads whose reports we have been accustomed to see do not appear in this month's report, notably the New York Central, the Reading, the Missouri, Kansas & Texas, the Denver, South Park & Pacific, the Atchison, Topeka & Santa Fe, the Cincinnati, Hamilton & Dayton, the Eastern, the Georgia, and the Scioto Valley. It is generally the case that the number of roads reporting increases when earnings increase and decreases when earnings fall off. In many cases other causes determine—frequently caprice—whether earnings shall be reported or not; but when the number of those which cease to report is large, we may fairly conclude that most of them do not make as good a showing as formerly. The stockholders themselves, who formerly welcomed the reports, exercise a pressure on the management to prevent the publication of the earnings, lest it may injure the market value of their property. Against the 47 roads reporting for January, we had 52 for December, and 57 for November. January earnings were reported by only 31 railroads in 1879 (when traffic was heavy, but not always profitable), and by 42 in 1880, when gains were large and general, and then, through 1880, as increases became more general, the number of roads reporting increased. In 1875, when business was prostrate, only 15 roads reported.

Below we give our usual table showing gross earnings in January *per mile of road* for the eight years since 1873 of all the roads whose reports we have been able to obtain.

January Earnings per mile of road for Eight Years.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
Bur., C. R. & Nor	$287	$277	$246	$314	$390	$270	$374	$297
Cairo & St. Louis	194	186	147	127	78	117	156	220
Cen. Pacific	632	692	700	676	522	502	511	581
Chic. & Alton	530	492	470	519	444	507	624	581
Chic. & East. Ill.	341	....	....	410	433	429	409	552
Chic., Mil. & St. P	468	333	377	266	500	342	350	272
Chic. & N. W.	....	445	440	396	519	468	504	441
C., C., C. & Ind.	968	708	758	589	853	609	799	767
Cleve., Mt. V. & Del.	....	.	185	168	186	181	218	251
Den. & R. G.	....	....	281	161	197	....	371	558
E. Tenn., Va. & Ga.	....	....	....	289	....	296	411	402
Flint & P. M.	270	....	....	....	....	276	373	453
Grand Trunk	....	....	....	536	614	496	573	581
Great Western	....	....	....	584	1,116	582	668	683
Hann. & St. Jo.	349	319	483	390	485	469	603	574
H. & Tex. Cen.	832	....	....	....	477	521	618	620
Ill. Cen., in Ill.	673	686	604	521	597	557	535	520
Ill. Cen., in Iowa	272	266	317	232	341	260	316	305
Ind., Bloom. & W.	441	339	388	266	351	391	376	422
Int. & Gt. Nor.	343	268	306	251	261	314	303	305
Louisv. & Nash.	620	485	495	461	511	463	609	440
Mem. & Charles	....	....	....	340	419	....	443	383
Mem., Pad. & N.	....	....	157	131	144	134	168	164
Mobile & Ohio.	569	373	441	441	516	384	494	432
Nash., C. & St. L.	....	436	509	432	510	451	453	381
Northern Cen.	1,040	864	911	909	785	813	1,026	1,185
Og. & Lake Champ.	....	....	.. ..	....	246	184	248	204
Paducah & Eliz.	....	....	....	....	150	138	199	256
Penna.	1,795	1,427	1,501	1,410	1,342	1,424	1,649	1,677
St. L., A. & T. H., Belleville Line.	544	806	549	724	564	682	792	953
St. L., Iron Mt. & So.	375	366	489	551	549	488	812	817
St. L. & San Fran.	445	....	519	316	296	241	387	339

The January earnings per mile of 16 railroads out of 32 were larger in 1881 than in 1880; of 24 out of 30 larger than in 1879; of 17 out of 30 larger than in 1878; of 22 out of 28 larger than in 1877; of 14 out of 23 larger than in 1876; of 13 out of 19 larger than in 1875; and of only 9 out of 21 larger than in 1874—the first January after the panic. It should be remembered, however, that the winter after the panic was for many railroads the best for earnings that they had ever had. There was an extraordinary crop and an unusual demand for it, which made the winter movement, at rates which would now be considered very high, much greater than had ever before been known. Among important roads, whose change in mileage has not been great, that had larger earnings then than they have ever had since are the Cleveland, Columbus, Cincinnati & Indianapolis, the Houston & Texas Central, the Indiana, Bloomington & Western, the International & Great Northern, the Mobile & Ohio, and the Pennsylvania. The currency earnings then, however, were equivalent to but nine-tenths of the sums in the present currency, and the working expenses were generally a much larger proportion of the earnings, so that profits in every case, probably, were larger this year.

The effect of higher prices will not be felt on railroad expenses much longer. Most roads advanced wages on the 1st of March last year, and most others within a month of that time. Prices of iron and steel were much higher at this time last year than now, but most roads in operation were then consuming for maintenance supplies bought the previous fall, at prices probably lower, rather than higher, than those now ruling. On the average prices of materials and labor will not show such a change after February that any considerable changes in expenses may be attributed to them.

JUMPING FROM THE TRAIN.

The courts are not agreed to enforce an absolute rule of law that for a passenger to attempt to climb upon a car after the train has started, or to jump from it before it has stopped, is such negligence on his part as deprives him, under all circumstances, of any claim against the company for a personal injury sustained. The drift of the decisions, however, clearly sustains the view that this conduct is presumably negligent. Ordinarily, the passenger must find his way to the cars before the start; and must wait, for leaving them, until the train has come to a stop. Special circumstances must exist to excuse him in a departure from this general rule. A passenger does not always act at his own risk in leaping upon or from a moving train; but he must be prepared to show unusual facts in order to cast the risk upon the company. This article will take the general rule for granted, and will narrate some of the more salient decisions in which the effect of special circumstances has been discussed.

The simplest cases are those in which the train does not stop as appointed, and the passenger claims that he was induced to jump by this breach of the company's obligation. A company owes a duty to passengers on its trains to make stops at the places for which they, respectively, hold tickets. Should no attempt or preparation be made for stopping—should the train, disregarding the appointed place, continue at full speed, no passenger would attempt to jump off, and, if one did, no court would hold that he was justified in so doing, by the fact that the company had engaged to let him leave the train at that place. But it has not unfrequently happened that a train has been slowed on approaching a designated station, and a passenger has been led to believe that it was intended he should jump, and that he must do so or he will be carried onward. Under such circumstances there is some ground to argue in his behalf that the company, being under obligation to stop the train for him, and having failed to do so, must bear the risk of any well meant and not especially foolhardy attempt on his part to leave the train, although it is moving. Each case must be judged on its own circumstances; it is for the jury to say whether the passenger was in fault in making the attempt he did. But the course of decision in the courts is that the passenger must not take any serious risk of this kind. If one buying a ticket from station A to station B finds that he is about to be carried beyond it, his remedy, in a legal view, is to submit to be carried, even to station C if necessary; and he is then entitled to recover compensation for his loss of time and for the cost and inconvenience of traveling back. But he is not entitled, unless the circumstances are such as to indicate that no risk whatever is involved, to leap from the train while in motion, and charge the company with the consequences of his fall.

Cases in which a person jumps from a train under a well grounded fear that it is on the point of a collision with another are decided on different principles: there the passenger makes the best choice he can, in the emergency, of the least of two dangers. But the simple fact that the passenger sees he is being carried past his rightful stopping place does not warrant his taking any personal risk in leaping. There seems no ground to doubt that the same principles apply to a case in which a person holding a ticket desires to take the train at any appointed stopping place; if it does not stop his legal right is to claim damages for his delay, not to run a risk in climbing aboard while it is in motion. The actual cases which have been presented to the courts have, however, generally been those of persons in the cars wishing to alight.

In a case in the latest published volume of Missouri reports the passenger was somewhat intoxicated. He alighted from the train while it was moving slowly past his designated station and was killed; probably by a train coming in the opposite direction. There was much dispute as to the precise circumstances—whether the train did not stop a few moments; whether the conductor did not direct the passenger to jump, etc.; but, aside from these details, the Court said that whether a passenger's attempt to leave a moving train is negligence such as discharges the company from all liability for such injury as he may sustain is, at least when the car is opposite the platform and is moving very slowly, a question for the jury to decide, in view of the circumstances. He will not be barred from a recovery if the course he took was such as really prudent men would usually take. But one who leaves a moving train under indications rendering his act imprudent, must bear the consequences. He can not charge them upon the company merely because it was in fault in carrying him past the place where it had agreed to leave him. Similarly in a Massachusetts decision rendered last fall, a passenger, not said to have been intoxicated, assumed to step from the train while it was slowly moving past the station where he intended to stop, and was struck by a train passing on the other track and killed. The decision was that he ceased to be a passenger by thus leaving the train, and was no longer entitled to claim protection as one. The Court said: It is true as a general rule that the right of a passenger to have his safety cared for by the company continues until he has had an opportunity by safe and convenient means to leave the train and roadway of the company, at the station to which he has bought a ticket. But this rule relates to passengers leaving the train while it is at a standstill. The corporation is not under obligations to make it safe for passengers to leave a train while it is in motion; and one who does so assumes all risk of injury. By leaving the moving train the plaintiff ceased to be a passenger; whether he did so while it was moving slowly near the station, or while it was moving rapidly between stations.

In a case decided in one of the subordinate courts of Pennsylvania during January, 1881, the facts were as follows: In the outskirts of Philadelphia the Frankford & Southwark Railway Company is accustomed to run a dummy engine and two ordinary street cars along one of the city streets; and the engineer is accustomed apparently to stop for passengers on their sig-

nal. The plaintiff, who was a young lad, signaled to the engineer to stop for him; and when the cars did not stop, he ran toward them; and, in attempting to get on the platform, his foot slipped and he fell under the wheel, by which his leg was so crushed that amputation was necessary. The jury found a verdict in his favor; but the Court decided that the company was not liable, saying that the important question was what duty was owing by the company to the would-be passenger. The train was bound to stop on his signal, and on failure to do so the company would be liable for damages resulting therefrom. But it would be irrational to say that a failure on the part of those in charge of the train to stop would justify any one old enough to travel alone in attempting to get on a moving train. The company's duty to the boy did not extend to his personal safety when not on the train as a passenger, nor to his safety getting on, unless the train had stopped. There was a decision to the same general effect by the New York Court of Appeals nine or ten years ago.

The question is often complicated by the circumstance that the conductor or a brakeman advises the passenger to jump. Now the courts are not agreed that either of the train hands is authorized, as agent of the company, to bind it by giving such a direction to a passenger, when the circumstances are such as to indicate to a prudent man that the leap is hazardous. But where the appearances are doubtful, and the passenger is unconversant with such matters, the fact of counsel given by any one in authority is nearly controlling to warrant a jury in saying that the jump was not an imprudent act—that is to say, was not apparently imprudent; and it is all that can be expected of a passenger carried past his rightful stopping place that he will avoid any apparent danger. In a Georgia case, decided nine or ten years ago, the train was slackened only, not stopped, and the passenger, being a heavy man, was afraid to get off. He expostulated with the conductor for not stopping, and the conductor angrily blamed him for not getting off. Then he did get off, while the train was running slowly, and injured his ankle. The jury found that he was not negligent under the circumstances, and the judges approved their verdict.

They said:

"Who that has seen much railroad traveling can fail to see in his mind the picture of this scene? The conductor in a pet, his train bound to take up its speed at an unusual point; the passenger conscious that he is giving unusual trouble; the train slacks its speed; he stands ready, the conductor ready also, to give the word—"now jump." None but a timid man would fail, and jump he did. We are clear this was not complying with the contract. Nor can this road defend itself on the idea that it acted so badly, that with ordinary prudence the man ought to have seen it was dangerous to jump. The railroad was bound to put him off: to stop its train for that purpose. This it failed to do, and it was not want of ordinary care in the passenger to use the only means to get off the course of the defendant permitted."

The claim seems even somewhat stronger in the case, which often happens, where the name of the station is called and the train actually halts, but does not stop long enough, and the passenger—perhaps from inattention, perhaps from inexperience, perhaps from being infirm, or overloaded with baggage—is delayed in reaching the steps, and must either alight after the train has started, or not at all. Here, again, each case must be judged on its own circumstances. The legal principles are that the company is bound to bring the train to a standstill at stations to which passengers are ticketed, and to provide safe means and allow reasonable time for their dismounting, and that the passenger is not entitled to make good a deficiency in these arrangements by leaping when it is reckless to do so. In a Massachusetts case, a woman nearly seventy, but remarkably active and vigorous, came to the platform as quickly as she could, after the station was called, but the train had already started onward, and she was badly hurt in stepping from it on the platform. The Court said she was clearly negligent, and could not recover. In a Missouri case, a lady passenger was accompanied by a little child; the stop was barely long enough for the child to alight, and it did so, but the lady, in following, after the train had started, was thrown down and hurt. The jury found that she was not negligent, and the Court approved, saying that she could not be expected, while standing on the steps of the car, after her child of three years old had been lifted out, to deliberate upon the propriety of following.

In a couple of instances, the person injured has been, not a traveler, but a person accompanying a lady, child or invalid to assist them to find a seat in the train, who has been hurt in leaving the cars, for want of time to get out before the starting. The tendency of opinion in cases of this class is, that the company owes, to such an escort, the same duty of caring for his safety that is due to a passenger; and is bound to give him reasonable time for leaving; but that his remedy for his failure to do so is an action for damages, not a dangergerous leap from the moving train and a suit for injury sustained.

"The Engineer."

It will be a matter of surprise to many of our readers to learn that this heretofore solemn journal, published on the other side of the Atlantic, has lately set up as a comic paper. In evidence thereof we give the following paragraphs, all from its columns:

"An electric head-light for locomotives will soon be tried on the Cleveland & Pittsburgh Railroad. The power will be furnished by a small engine placed behind the smoke-stack and furnished with steam from the main boiler. It seems to us that electric head-lights are always going to be tried. It is about time that American locomotive superintendents—we beg pardon, master-mechanics—began. The electric head-light is just the thing for unfenced railway. If properly managed, it would awaken sleeping cows; and if applied to some of the fast-time trains, of which we have heard so much, electric head-lights would produce streaks of light across the country which might be readily mistaken for dawn, and so wake up all creation."

This is very funny, but the following is still more so:

"'This continent,' says the *American Manufacturer*, 'seems destined to be the highway of the nations of the world, between the Atlantic and Pacific oceans. The Union and Central Pacific is completed; the Atchison, Topeka & Santa Fe will in a few weeks connect with the Southern Pacific, of California; the completion of the North Pacific, the Texas Pacific, and the Mexican National roads is secured; the Canada Pacific is pushed with such backing that its completion may be looked upon as assured within ten years; while two schemes for ship canals and one for a ship railroad are in such shape that the completion of two of the three may be counted among the great engineering works to be completed in this generation.' If a continent like America *will* get in the way what can it expect? People must cross it somehow, especially English people, who, when they take a fancy to go anywhere, generally go in spite of obstacles."

If history is correct, some "English people" tried to cross a part of this continent about a century ago with only limited success. Since then things have changed, and now it is proposed to erect a colossal cast-iron statue at the entrance to New York harbor, representing Brother Jonathan pointing British emigrants toward prosperity and the setting sun. That the execution of such a work of art is possible in this country is indicated by the following paragraph, also from *The Engineer*:

"The *American Manufacturer* is lost in admiration of a casting shown at the Brussels National Exhibiton by the Seraing works. It consists of what is practically the whole cast-iron work of a marine engine, with a pair of cylinders about 20 in. diameter by 20 in. stroke, cast in one piece—bed-plate, condenser, air, and feed, and bilge pumps, standards, cylinders and exhaust pipe. Our contemporary forgets that Messrs. Winans, many years since, are reported to have done much more. They took contracts from the Russian government for locomotives. These engines were paid for by the pound, and, weight being no objection, are said to have been cast whole, and to have been such triumphs of the founder's art, that when lifted out of the mould, fettled up a bit, and lubricated, steam could be got up in them and the engine put to work at once. The United States need fear no rivalry while her sons can accomplish such feats as that."

Of our patent-office *The Engineer* makes the following astounding statement:

"For important inventions, involving new principles, we may search almost in vain in the United States Patent-Office. There are, of course, a very few exceptions to this rule."

Let all good Americans be thankful for the exceptions.

In an article criticising Mr. Wootten's passenger locomotive, of which we gave engravings a few weeks ago, some of which *The Engineer* copied (and did not give credit for), that paper, in its issue of Feb. 11th, says:

"Until American engineers give up anthracite they will never attain perfection in fast locomotives. There seems to be an insuperable difficulty in burning it quickly enough. The consumption of coal in English engines is at the rate of 90 lbs. or 100 lbs. per square foot of grate per hour with fast trains. * * * Mr. Wootten's engine seems to be unable to burn more than half this quantity of anthracite in the time. Hence the colossal fire-box, which spoils the whole engine. * * * When American engineers establish services of really fast trains on all their principal lines, they will find it pay to give up anthracite in favor of coal. * * American railway men if they want to run fast must not be too proud to take a lesson from those who have been running fast all their lives; and English engineers will tell them, to a man, that unless anthracite can be burned in some box of less dimensions than that used by Mr. Wootten, it had better not be burned at all in a fast locomotive."

Certainly the advice *The Engineer* gives us must be facetious. Mr. Wootten's engines, it should be remembered, were designed for and are used on the Philadelphia & Reading Railroad, the owners of which are not only engaged very largely in carrying, but in mining, anthracite coal. Not a pound of bituminous coal can be mined along its line. Anthracite is, therefore, very cheap for it and bituminous coal dear. Now, in the face of these facts, *The Engineer* advises Mr. Wootten not to build engines to suit the fuel which is cheapest, but to imitate the practice of English engineers and get fuel in this country to suit the style of engines used in theirs. We have too much respect for the opinion of English engineers to believe that "to a man," or that one in a hundred of them would give any advice so absurd as this. The fact is that anthracite coal burns very slowly, and a large fire-box is needed for that reason, and in view of this circumstance Mr. Wootten designed his engines to suit the coal, rather than get coal to suit the engines. It will be seen from this that even in its professional advice *The Engineer* has become comic as well as in its animadversion on America and things which are American.

In the same number that contains the "bouffe" advice about locomotives there is an article showing that in Russia American plows have been a dead failure. As we know nothing at all about the trial which it reports with so much glee, it is impossible to admit or deny its statements. It must be said, though, that for a nation that does not know how to make plows, the United States does manage to grow a somewhat unusual quantity of wheat, corn, etc.

Considering the fact of the immense superiority of Englishmen in the matter of crossing continents, as inventors, as locomotive-builders and as plow-makers, this country now offers great attractions. Millions of acres await the occupation of the settler, uncounted sums are ready to be poured out for the development of useful inventions, our locomotive shops are filled to running over with orders, so much so that the buyer, and not the seller, has become the party who solicits business, our plow factories are unable to supply the home demand, and are, therefore, giving little attention to the Russian market. For these reasons, then, the United States is a veritable promised land for those English engineers, inventors and mechanics, who, *The Engineer* tells us, are so much superior to our own. In the name of Brother Jonathan and the American eagle, we invite such. A hospitable welcome and all the privileges of citizenship await them, excepting that of becoming President: we must draw the line somewhere. But some things they would better leave behind. If they cherish any prejudices as one-sided or as unfair as those which *The Engineer* exhibits, then they will do best not to bring them over. There is no telling what such sentiments might lead them to do if once removed from the restraining influence of home and friends. *The Engineer* for a long time has been engaged in purloining paragraphs and engravings without giving credit, which shows how persons and papers deteriorate when they fail to preserve the aroma of justice and righteousness.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Little Rock, Mississippi River & Texas.—The *Little Rock* Division is completed by laying track from Bayou Fourche, Ark., southeast 15 miles.

East Texas.—Extended from Pine Island Bayou, Tex., north to Concord, 4 miles.

Gulf, Colorado & Santa Fe.—Extended from Leon River, Tex., north by west to Belton, 7 miles.

This is a total of 26 miles of new railroad, making 199 miles reported thus far this year, against 497 miles reported at the same time in 1880, and 97 miles in 1879.

PENNSYLVANIA RAILROAD EARNINGS were smaller last January than in any month of 1880 except January and February, but were larger than in any previous January—only 3.4 per cent. more than in 1880, but 25.4 per cent. more than in 1879, and 33 per cent. more than in 1878 and 1877. Considering the lower rates on through freight east, the obstacles that the severe weather has caused and the very heavy traffic last year, the earnings this year should be regarded as satisfactory. The increase in expenses is less than has been reported in several previous months, and is not more than would be expected in strictly working and maintenance expenditures, these being swelled not only by the higher prices but by the stormy winter. The decrease in net earnings is 11.7 per cent., and this was probably equalled on many and exceeded on some important roads last January, especially where the traffic has been greatly interrupted by snow.

The mileage worked, gross earnings, working expenses and net earnings in January for nine years have been:

Year.	Miles.	Gross Earnings.	Expenses.	Net Earnings.
1873	1,547	$2,754,284	$2,194,652	$559,632
1874	1,657	2,856,165	1,736,489	1,119,676
1875	1,677	2,290,339	1,630,767	659,572
1876	1,697	2,447,685	1,681,760	765,925
1877	1,756	2,383,566	1,656,014	727,552
1878	1,848	2,396,297	1,518,098	878,199
1879	1,852	2,543,424	1,523,893	1,019,531
1880	1,872	3,083,551	1,717,453	1,366,098
1881	1,902	3,189,215	1,982,554	1,206,661

The winter expenditures are likely to be greatly affected by the weather in transportation expenses; but in maintenance—at least in maintenance of road—there is less room for fluctuations, because then few rails and ties can be laid, though the amount of labor required to keep the track clear varies greatly. The enormous expenses of January, 1873 (80 per cent. of the earnings, leaving net earnings only half as great as in the next January), must have been largely caused by the terrible winter weather that month, when all over the North, most tracks being of iron then, breakages of rails were an every day occurrence. Generally we see that there was a nearly continuous decrease in expenses from 1873 to 1878, and a quite rapid increase since. The fluctuations in expenses (which, it must be remembered are, much greater when taken by months than when taken by years) joined with the fluctuations in receipts have caused very great fluctuations in net earnings. Thus they were 144 per cent. more in 1880 than in 1873, and as we have already said, twice as great in 1874 as in 1873. Though there is a considerable decrease this year when compared with last, still with that exception last January's net earnings were larger than ever before.

A NEW ROUTE TO VERA CRUZ has been established, by which the voyage is reduced to a passage across the Gulf at Morgan City (81 miles west of New Orleans), which is much shorter than the voyage from New Orleans, as the mouth of the Mississippi is nearly east of New Orleans, and from the mouth west as far as Morgan City is about 150 miles. The distance from Morgan City to Vera Cruz is about 800 miles—the same as from New York to Savannah, and the advertised time from New Orleans to Vera Cruz is three days.

The vessels are put on by the Morgan Company, which owns the railroad, and has so long carried the larger part of the Texas traffic to and from New Orleans. It is probably due to the increased communication between this country and Mexico, largely in consequence of the construction of new railroads in the latter. At present there are but two steamers monthly, sailing from Morgan City on the 1st and 16th. By this route the distance from New Orleans to the city of Mexico is 1,150 miles—about as far as from Boston to St. Louis. The distance from New York to New Orleans by rail is about 1,400 miles, so the whole distance from New York to the city of Mexico by this route is 2,550 miles. Moreover, this is as nearly an air line as is usually attained anywhere. An all-rail line would have to be diverted some 350 miles northwest of an air line, in order to avoid the gulf. The rail distance by the combined Iron Mountain and International roads is 927 miles for the completed part from St. Louis to San Antonio, whence in an air line to the Mexican border is 250 miles, and thence to the city of Mexico in an air line 550 miles. This makes a distance of 1,727 miles (which will probably be lengthened to nearly 1,800 by diversions from an air line) from St. Louis to the city of Mexico, the distance via New Orleans and Morgan City being 1,850 miles. From New York the rail distance by way of St. Louis would be about 2,850 miles, but by way of Cairo the distance would be somewhat less. This is about 500 miles less than the distance from New York to San Francisco, and about 300 more than the distance by way of New Orleans and the Gulf. It will be impossible by any new railroads to lessen materially the distance by the present route to Mexico from New York, and very little from any part of the country as far east as the Mississippi, but of course a through railroad would shorten the time of the journey considerably.

Locomotive Building in Paterson.

The Paterson (N. J.) *Press*, in closing a series of interesting historical articles on the locomotive shops of that city, gives the following general statements:

The following figures represent the total yearly production of all the works, including the establishment of William Swinburne—which contributed its quota from 1852 to 1857—from 1837 to 1880, inclusive. From these will be seen, as by noting the rise and fall of the sensitive mercury, the temperature is indicated, the various fluctuations in the business of the country, and the successive periods of prosperity and depression can be readily marked:

1837	1	1859	110
1838	7	1860	134
1839	11	1861	78
1840	7	1862	115
1841	9	1863	181
1842	6	1864	223
1843	9	1865	215
1844	12	1866	223
1845	14	1867	168
1846	17	1868	156
1847	22	1869	276
1848	39	1870	322
1849	51	1871	325
1850	53	1872	357
1851	67	1873	403
1852	109	1874	113
1853	166	1875	80
1854	183	1876	67
1855	148	1877	48
1856	176	1878	105
1857	151	1879	112
1858	48	1880	247

To assist in a clear understanding of the status of this industry, which, from its peculiar character, is dependent, par excellence, upon the general prosperity of the country for its own prosperity, and is, in consequence, an excellent barometer, we furnish the following exhibit of the condition of business in 1873, 1877 and 1880 respectively, the former having been the best year ever known in the industry in Paterson, the second the most depressing, the latter the latest whose production has been recorded:

Year.	No. of Engines built.	No. men employed.	Total amount of wages.	Total value of Product.
1873	403	3,172	$1,850,077.18	$6,976,750
1877	48	325	165,137.91	707,750
1880	247	2,387	976,505.00	2,417,000

In the above the product of the Danforth Works is regarded as one-fourth machinery and three-fourths locomotive engines, as before noted—this is the estimate by the company's officers—and only the locomotive product enters into the account.

TOTALS.

Below will be found interesting figures which show at a glance the total number of engines built in Paterson, at the then existing works and at the one now extinct, Mr. Swinburne's; also the total estimated value, the estimate being based on figures furnished at the different works, showing the prices of engines at different dates; also the area occupied, capital invested, etc.:

Total number of engines built from 1837 to 1880, inclusive	5,414
Total value of locomotive product, estimated	$81,210,000
Total number of buildings now occupied	72
Total area of flooring space occupied, in sq. feet	615,000
Total capital invested in locomotive construction, about	$2,000,000

It is probable that in 1881 more locomotives will be turned out than in 1873, as there is demand for all that can be made, and all the shops have better facilities now.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Midland, of New Jersey, annual meeting, at the Hotel Windsor in Jersey City, N. J., March 31, at noon. No stock transferred after March 10 can be voted on.

Philadelphia & Reading, special meeting in the Assembly Building, Tenth and Chestnut streets, Philadelphia, March 14, at noon.

Dividends.

Dividends has been declared as follows:

Boston & Albany, 2 per cent., quarterly, payable March 31.

Chicago & Northwestern, 1¼ per cent., quarterly, on the preferred stock, payable March 18.

Fast Freight Line Meeting.

A dispatch from Buffalo, March 2, says: "A special meeting of the general freight agents and managers of the fast freight lines was held here to-day, at which arrangements were made for meetings for the ensuing year as follows: March, Cincinnati; April, New York City; May, St. Louis; June, Buffalo; July, Boston; August, Niagara Falls; September, New York City; October, Chicago; November, Indianapolis; December, New York City."

ELECTIONS AND APPOINTMENTS.

Alabama Railroad Commission.—Mr. W. L. Brigg has been appointed President of the Railroad Commission established by the law just passed by the Alabama Legislature.

Messrs. Joseph Crook and Charles P. Ball have been nominated and confirmed as the other members of the Board. Col. Ball was formerly General Manager of the Western Railroad, and afterwards for several years General Superintendent of the Alabama & Chattanooga road, now the Alabama Great Southern.

Atlantic & Pacific.—Mr. John W. Mass has been appointed General Freight and Passenger Agent, with office at Albuquerque, N. M. He was formerly General Ticket Agent of the St. Louis & Southeastern.

Boston & Albany.—The board has re-elected William Bliss President and J. A. Rumrill Clerk.

Brattleboro & White Hall.—At the annual meeting in Brattleboro, Vt., the following directors were chosen: F. Goodhue, J. W. Melendy, J. H. Phelps, O. L. Sherman, A. Stoddard, C. F. Thompson, E. L. Waterman. The board elected C. F. Thompson President; John A. Butler, Secretary and Treasurer.

Burlington, Cedar Rapids & Northern.—At the annual meeting held Feb. 22, the following directors were chosen: J. W. Blythe, Lyman Cook, D. C. Peasely, C. P. Squires, Joshua Tracy, Burlington, Ia.; C. D. Close, Iowa City, Ia.; J. N. Dewey, Des Moines, Ia.; W. M. Carscaden, Muscatine, Ia.; E. S. Bailey, Clinton, Ia.; Wm. Griggs, Davenport, Ia.; C. Lynde, Rock Island, Ill.; John I. Blair, Blairstown, N. J.; Charles Bard, Norwich, Conn.

Camden & Atlantic.—At the annual meeting in Camden, N. J., Feb. 24, the following directors were chosen: Charles D. Freeman, John Lucas, James B. Dayton, Enoch A. Doughty, Thomas H. Dudley, Samuel C. Cooper, George T. DaCosta, Joshua R. Jones, William C. Houston, George W. Steever, Edmund E. Read, John Pearce, John B. Hay.

Canada & Atlantic.—At a meeting of the board in Ottawa, Feb. 26, Mr. E. McGillivray was chosen President, in place of D. A. McDonald, resigned. The board also elected Allan McNab First Vice-President, and M. Perley Second Vice-President.

Canada Southern.—It is stated that the position of Manager has been offered to Mr. M. D. Woodford, formerly Superintendent of the Toledo Division, but for some time past General Manager of the Ft. Wayne & Jackson road.

Denver & Rio Grande.—Mr. G. W. Vaughn has been appointed Superintendent of the Gunnison Extension, and will have charge of the completion of that line. Mr. George W. Cook, late General Agent at Leadville, succeeds Mr. Vaughn as Superintendent of the Kokomo Extension.

Housatonic.—At the annual meeting in Bridgeport, Conn., Feb. 25, the following directors were chosen: Wm. H. Barnum, Lime Rock, Conn.; George W. Peet, Falls Village, Conn.; A. B. Mygatt, New Milford, Conn.; Wm. D. Bishop, Horace Nichols, Bridgeport, Conn.; David S. Draper, Samuel Willetts, Edward Leavitt, John B. Peck, New York. The board re-elected Wm. H. Barnum, President; David S. Draper, Vice-President; C. K. Averill, Secretary and Treasurer.

Indianapolis & St. Louis.—At the annual meeting recently the following directors were chosen: J. H. Devereux, S. Burke, Cleveland, O.; J. N. McCullough, Thomas D. Messler, Pittsburgh, Pa.; George B. Roberts, Philadelphia; Hugh J. Jewett, New York. The board re-elected J. H. Devereux, President; Edward King, Secretary and Treasurer; Russell Elliott, Auditor.

Lawrence.—At the annual meeting in Pittsburgh, Feb. 25, the following directors were chosen: A. L. Crawford, R. W. Cunningham, James B. Jackson, J. D. Layng, George W. Cass, J. N. McCullough, Thomas D. Messler. The road is leased to the Pennsylvania Company.

Lehigh & Wilkesbarre Coal Co.—At the annual meeting in Philadelphia, Feb. 24, the following choice of officers was made: President, F. S. Lathrop; directors, F. A. Potts, G. G. Haven, Charles Parrish, J. N. A. Griswold, John Kean, J. S. Barnes.

Louisville & Nashville.—At a meeting of the board held Feb. 26, Mr. C. C. Baldwin, late Vice-President, was chosen President in place of E. H. Green, resigned. Mr. George A. Washington, of Nashville, Tenn., was chosen Second Vice-President.

The following appointments took effect March 1: Mr. Geo. Nason, Superintendent of the Pensacola Railroad, the Pensacola & Selma (Extension), and the Pensacola Steamship Company, with headquarters at Pensacola, vice W. D. Chipley, transferred.

Mr. W. D. Chipley, Superintendent of the Mobile & Montgomery Railway, the Selma Division Western Railroad of Alabama, and the Pensacola & Selma (Pine Apple Division), with headquarters at Montgomery, vice Mr. B. Dunham, resigned.

Mr. E. Marsh, Acting Superintendent South & North Alabama Railroad, with headquarters at Birmingham, Ala., vice B. Dunham, resigned.

Massachusetts Railroad Commission.—Mr. Clemens Herschel, of Holyoke, has been appointed Railroad Commissioner, in place of A. D. Briggs, deceased. The law required the appointment of an engineer, and Mr. Herschel has already a considerable reputation. He graduated from the Lawrence Scientific school of Harvard College, and afterwards studied for several years in France and Germany. As an engineer his attention has been chiefly devoted to bridge and hydraulic work, and he is now Chief Engineer of the Holyoke Water Power Company. Mr. Herschel is a descendant of the famous astronomer of that name.

Memphis, Pine Bluff & Texas.—The officers of this company now are: President, R. W. Martin; Vice-President, W. M. Harrington; Secretary, G. P. C. Rumbough; Treasurer, W. J. Thomson.

Missouri Pacific.—At the annual meeting in St. Louis, March 1, the following directors were chosen: D. K. Ferguson, Webb M. Samuel, St. Louis; J. L. Stephens, Boonville, Mo.; S. T. Smith, Leavenworth, Kan.; S. H. H. Clark, Omaha, Neb.; F. L. Ames, South Easton, Mass.; W. F. Buckley, Sidney Dillon, Thomas T. Eckert, George J. Forrest, Jay Gould, Russell Sage, Samuel Sloan, New York. The only new director is Mr. Sloan, who replaces Oliver Garrison. The board re-elected Jay Gould President.

Montpelier & Wells River.—At the annual meeting in Montpelier, Feb. 23, the following directors were chosen: Joel Foster, S. C. Shurtleff, Montpelier, Vt.; W. H. H. Bingham, Stow, Vt.; S. S. Thompson, Lyndon, Vt.; D. R. Sortwell, Cambridge, Mass. The board re-elected D. R. Sortwell, President; S. S. Thompson, Vice-President; Joel Foster, Jr., Clerk and Treasurer; S. C. Shurtleff, Attorney; W. A. Stowell, General Superintendent; Frederick Morse, General Passenger Agent.

Northern Central.—At the annual meeting in Baltimore, Feb. 24, the following directors were chosen: G. B. Roberts, Wistar Morris, Samuel C. Huey, John P. Green, Edmund Smith, George Small, B. F. Newcomer, S. M. Shoemaker, J. N. Hutchinson, Dell Noblit, Harry Walters, Henry Gilbert. The board re-elected George B. Roberts, President; A. J. Cassatt, Vice-President; Stephen W. White, Secretary; John S. Leib, Treasurer.

Philadelphia, Wilmington & Baltimore.—At a meeting of the board held Feb. 24, Robert Garrett and G. G. Haven were chosen directors in place of Nathaniel Thayer and Nathaniel Thayer, Jr., resigned. It is understood that further changes will be made soon.

Pittsburgh & Castle Shannon.—At the annual meeting last week the following were chosen: President, J. H. Ortman; directors, H. M. Rolfe, John Jahn, James McMasters, C. Kohlmyer, S. Kaufmann, J. F. Denniston, Walter Chess, Samuel Gallinger, F. D. McKeever.

Pittsburgh, Cincinnati & St. Louis.—The following circular, dated Feb. 26, announces the divisions and offices on the leased Columbus, Chicago & Indiana Central road:

"On and after Sunday, Feb. 27, 1881, the territory of officers of these divisions will be divided as follows, viz.:

"Second and Third divisions east, from Logansport to Bradford Junction and to Richmond; D. T. Bacon, Master of Transportation; W. G. Sala, Chief Train Dispatcher; C. C. F. Bent, Engineer Maintenance of Way; J. Zecher, Road-Master.

"Second and Third divisions west, from Logansport to Chicago, and to State Line; J. R. Trimmer, Master of Transportation; L. M. Harris, Chief Train Dispatcher; J. Lumsden, Road-Master.

"Logansport shop and yards will be under the control of the Superintendent of Second and Third divisions west."

"All mileage, time, car and other reports must be sent to Logansport as at present, addressed to the respective Superintendents."

Mr. J. F. Miller is Superintendent of Second and Third divisions east; Mr. Ralph Peters, Superintendent of Second and Third divisions west.

St. Louis, Arkansas & Texas.—At the annual meeting in St. Louis, March 1, the following directors were chosen: C. E. Harman, John O'Day, Springfield, Mo.; George F. Purdy, Peirce City, Mo.; Alexander Douglas, Alexander Graydon, C. W. Rogers, St. Louis; James D. Fish, Jesse Seligman, Edward F. Winslow, New York.

St. Louis & Eastern.—The directors of this new company are: Henry Lutton, S. H. Parker, Victor Sherman, J. C. Sinclair, St. Clair County, Ill.; Andrew Donnan, Eber Peacock, Horace A. Stephens, St. Louis.

St. Louis, Iron Mountain & Southern.—At the annual meeting in St. Louis, March 1, the following directors were chosen: R. Kerens, Rufus J. Lackland, St. Louis; Henry Whelen, Philadelphia; Frederick L. Ames, South Easton, Mass.; Sidney Dillon, Thomas T. Eckert, Jay Gould, Joseph G. Lowery, George B. McClellan, Henry G. Marquand, Russell Sage, Samuel Sloan, John T. Terry, New York. Of the board chosen a year ago Thomas Allen, W. R. Allen, Warren Delano, G. S. Drake, R. A. Edgerton, J. R. Lionberger and W. M. Senter are now retired, the new members being Messrs. Gould, Sage, Dillon, Eckert, McClellan, Ames and Kerens. The new board elected the following officers: President, Henry G. Marquand; Vice-President, T. T. Eckert; Secretary and Assistant Treasurer, S. D. Barlow; Treasurer, D. W. McWilliams; General Auditor, J. W. Wallace; General Manager, A. W. Soper. Mr. Marquand succeeds Thomas Allen as President, and is succeeded by Gen. Eckert as Vice-President; the other officers are re-elected.

Mr. John J. Rogers has been appointed Assistant General Freight Agent, in place of Mr. E. K. Sibley, who is now General Manager of the Memphis & Little Rock.

St. Louis & San Francisco.—At the annual meeting in St. Louis, March 1, the following directors were chosen: C. W. Rogers, St. Louis; John O'Day, Springfield, Mo.; Ozias Bailey, White Cloud, Kan; Walter L. Frost, Francis B. Hayes, Albert W. Nickerson, Alden Speare, Boston; Edward D. Adams, Wm. P. Buckley, Frederick Butterfield, James D. Fish, Jesse Seligman, Edward F. Winslow, New York.

Terre Haute & Mississippi.—The office of this new company is at Terre Haute, Ind.; its directors are: G. Ehrman, Theodore Hodnut, Herman Hulman, Willard Kidder, E. B. McClure, R. S. Thompson, R. S. Cox.

Utah & Nevada.—The directors of this company, successor to the Utah Western, are: Abram Gould, Bo ivar Roberts, James Sharp, W. W. Riter, P. L. Williams, LeGrand Young, Salt Lake, Utah; E. F. Bishop, T. L. Watson, Bridgeport, Conn.; R. L. Bassett, Birmingham, Conn.; Cyrus W. Field, Benjamin Richardson, New York.

Wabash, St. Louis & Pacific.—Mr. S. Howell, Division Freight Agent at Logansport, having resigned his position, Mr. J. M. Osborn, Commercial Agent at Toledo, will have supervision of all freight matters east of Danville, Illinois.

West New Hampshire.—At the annual meeting last week the following directors were chosen: E. F. Lane, F. F. Lane, Keene, N. H.; C. J. Amidon, D. F. Ferrin, Hinsdale, N. H.; D. P. Crocker, George E. Frink, A. B. Harris, Springfield, Mass. The board elected A. B. Harris, President.

PERSONAL.

—Capt. Benjamin H. Fletcher, ex-Assemblyman and Vice-President of the Lockport & Buffalo Railroad Company, died at Lockport, N. Y., March 1.

—It is reported that Mr. Leslie P. Farmer, General Passenger Agent of the Pennsylvania Railroad Company, will soon resign his position on account of ill health.

—Mr. B. Dunham has resigned his position as Superintendent of the South & North Alabama, the Mobile & Montgomery and the Pensacola & Selma divisions of the Louisville & Nashville Railroad.

—Mr. Edward H. Green has resigned his position as President of the Louisville & Nashville Company. He has been Vice-President over a year and President only three months. He still remains a director of the company, in which he is said to be the largest stockholder.

—Mr. James McMillan, of Detroit, was, on Feb. 22, presented with a valuable painting (a marine view by De Haas) by the heads of departments and foremen of the Michigan Car Works, Detroit Furnace Co., Fulton Engine Co., De-

troit Car Wheel Co., Baugh Forge and other enterprises of which he is the head.

—Mr. Robert Hays, Superintendent of the Woodruff Sleeping Car Company, was killed at the Union depot in Cleveland, O., March 1, being run over by a yard engine as he was crossing the tracks. Mr. Hays had been with the Woodruff company several years, and was formerly with the Pullman Company: he was well known as a very shrewd and active man.

—Hon. P. W. Strader, well known in Ohio, died at his residence in Ashtabula, Feb. 26, aged 73 years. He was born in New Jersey but was taken to Ohio by his parents when only a year old. When quite a young man he became a steamboat clerk on the Ohio River, and in 1848 was appointed General Passenger Agent of the Little Miami road and held that position for 19 years. In 1868 he was elected to Congress from the First Ohio District and served one term.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Month of December:				
Col., Chi. & Ind. Central	$410,090	.....	.....	....
Net earnings	17,273	.....	.....	....
Month of January:	1881.	1880		
Northern Central	$386,156	$334,494	I. $51,662	15.4
Net earnings	140,186	120,434	I. 19,752	16.2
Pennsylvania	3,189,215	3,083,551	I. 105,664	3.4
Net earnings	1,206,661	1,363,098	D. 159,437	11.7
Third week in February:				
Chi. & Eastern Ill.	$25,532	$21,416	I. $4,116	19 2
Northern Pacific	27,561	19,315	I. 8,246	43.3
St. L., Iron Mt. & So.	151,700	138,752	I. 12,948	9.3
Week ending Feb. 18:				
Great Western	$97,946	$86,218	I. $11,728	13.6
Week ending Feb. 19:				
Grand Trunk	$204,923	$195,067	I. $9,856	5.1

Grain Movement.

For the week ending Feb. 19 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874	1,577,063	782,701	1,996,577
1875	1,959,010	495,562	1,775,220
1876	2,828,007	1,323,751	2,483,357
1877	2,516,562	1,016,305	1,866,919
1878	2,379,274	1,671,283	3,314,860
1879	2,791,234	1,693,992	4,270,408
1880	3,356,490	1,141,510	2,489,995
1881	1,264,188	1,433,421	3,197,435

The Northwestern receipts were greatly interrupted by storm and floods, Toledo, which was almost blockaded with floods, reporting none for the week. Not only were the receipts of these Northwestern markets smaller than in the corresponding week of any of the same previous years, but they were hardly half as great as the week before, but in all the time since July, 1873 (which is as far back as we have the receipts by weeks), there have been but *two* weeks (one in March, 1877, and one in April, 1875), when their receipts were so small, and there have been some terrible winters in this time.

The shipments of these markets, however, were larger than in the corresponding week of last year, and though, with one exception, the smallest for a year, not very much smaller than in any of the four preceding weeks, which indicates that the lines to the East were not nearly so much disturbed as those to the West from these markets.

The Atlantic receipts were nearly a third larger than in the corresponding week of last year, but smaller than in the corresponding weeks of 1879 and 1878 (when rates were very low). They were, moreover, the largest they have been for ten weeks, and have seldom been exceeded in a January week.

Of the Northwestern receipts Chicago had 45.4 per cent.; Peoria, 15.3; St. Louis, 13.5; Milwaukee, 11.2; Detroit, 7.7, and Cleveland, 6.9 per cent. Chicago does not appear to have suffered as much proportionately as St. Louis and Peoria, neither of which received half as much as the week before.

Of the Atlantic receipts New York received 44.9 per cent.; Baltimore, 19.2; Philadelphia, 16.8; Boston, 11.3; New Orleans, 6.3; Portland, 1.1, and Montreal, 0.4 per cent. New York's receipts were greater than in any other week since navigation closed, and a much larger proportion of the whole than for some weeks past. Philadelphia's also are considerably larger than heretofore recently.

Exports of flour and grain for five successive weeks have been:

	Week ending—				
	Feb. 23.	Feb. 16.	Feb. 9.	Feb. 2.	Jan. 26.
Flour, bbls.	111,022	120,932	89,284	123,930	147,994
Grain, bush.	1,758,010	2,476,801	2,194,050	2,029,828	2,101,331

The exports are again very light.

Coal Movement.

Coal tonnages for the week ending Feb. 19 are reported as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Anthracite	524,826	261,026	I. 261,800	99.5
Semi-bituminous	81,426	82,557	D. 1,131	1.4
Bituminous, Penna	58,896	47,438	I. 11,458	24.2
Coke, Penna	46,933	34,539	I. 12,394	35.9

Cumberland production is still light, though the demand for semi-bituminous coal at tidewater is still active, and Clearfield shipments are large.

The anthracite companies have decided to continue the February price list for March. Some of the carrying companies have increased the freight rate to local points.

Shipments over the Seattle & Walla Walla road and by water from Seattle, Wash. Ter., in January were 10,417 tons. In January, 1880, only 1,365 tons were shipped, on account of obstructions on the railroad.

The anthracite coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the two months ending Feb. 26, was as follows:

	1881.	1880.	Increase.	P. c.
South Amboy for shipment	76,208	66,829	9,379	14.0
Local distribution on N. J. lines	135,976	68,318	67,658	99.5
Co.'s use on N. J. lines	18,043	16,422	1,621	9.9
Total	230,227	151,569	78,658	51.7

Of the total this year 189,174 tons were from the Lehigh, and 41,053 tons from the Wyoming Region.

Petroleum.

Stowell's *Petroleum Reporter* gives the product of the Pennsylvania oil regions for January as follows, in barrels of 42 gallons:

	Jan., 1881.	Dec., 1880.	Inc. or Dec.	P. c.
Production	2,244,090	2,238,634	I. 5,456	0.2
Shipments	1,061,617	1,336,613	D. 274,996	20.5
Stock, at close of month	20,110,903	18,928,430	I. 1,182,473	2.8
No. of producing wells	14,900	14,700	I. 200	1.4

Pipe line reports for the month give receipts of 2,050,746 barrels; deliveries, 1,062,028 barrels. The Tidewater Pipe Line reports receipts of 160,443 barrels; deliveries, 115,170; oil on hand or in transit by rail from Williamsport to Bayonne, 1,574,991 barrels.

British Rail Exports.

The exports for the month of January are reported as follows by the Board of Trade:

To United States:	1881.	1880.	Decrease.	P. c.
Iron	5,663	7,941	2,278	28.7
Steel	1,705	7,350	5,645	76.8
Total	7,368	15,291	7,923	51.8
To all Countries:				
Iron	7,084	11,143	4,059	36.5
Steel	23,240	28,916	5,676	19.6
Total	30,324	40,059	9,735	24.3

The decrease in exports to this country is very marked. The total in January would have laid but 84 miles of track, and this is not as much as two days' average consumption.

Montreal Passenger War.

The Delaware & Hudson Canal Company last week began to cut passenger rates from Montreal, and is now allowing a rebate of $7 from the regular passenger fare of $9 between Boston and Montreal—that is, it is carrying passengers for $2 between the two cities by way of Rouses Point and Albany, and from this the proportions of the Grand Trunk and the Boston & Albany have to be paid. The Central Vermont, which has the shortest route for Boston business, has not yet cut rates, and the war has not extended to the Montreal-New York business. The Delaware & Hudson claims that the cut is made in consequence of a violation of contract by the Central Vermont. The latter company, however, claims that the object is to force it into making a new contract on Montreal business.

California Commission Rates.

The California Railroad Commissioners have passed resolutions adopting a schedule of passenger fares between all the leading points in the state, and have served copies on all the railroad companies. The schedule does not seem to be based on any uniform principle; the rates vary from 2.2 to 5 cents per mile. It is provided that stop-over checks must be given to passengers on application, and that rates shall be uniform over each section of road designated by the board; that is, there shall be a uniform rate per mile for each section. These sections, however, include only parts of roads: thus the Southern Pacific is allowed on different sections of its line to charge 2¾, 3, 3½, 4½ and 5 cents per mile, the lowest rate being between Los Angeles and Wilmington, and the highest between Los Angeles and Yuma. Second-class rates are not to exceed 60 per cent. of first-class.

The board is now considering the question of freight rates.

St. Louis to Europe.

A dispatch from St. Louis, March 2, says: "A corporation has been organized here, called the St. Louis, New Orleans & Foreign Dispatch Company, the purpose of which is to forward in bulk grain, all kinds of produce and merchandise direct from St. Louis to Liverpool and other foreign ports. Through bills of lading will be given here on all freight destined for Europe. The barge lines between here and New Orleans will be used to convey the grain in bulk, and the Anchor Line of steamers for the transportation of other freight. Through bills of lading will also be given at European points on all merchandise destined for St. Louis. B. W. Lewis, formerly President of the St. Louis, Kansas City & Northern Railroad, is President of the company; W. M. Samuel, a prominent merchant, Vice-President; James R. Bull, one of the oldest and most experienced transportation men of the city, General Manager, and several solid business men are in the Directory. The company will have offices in New Orleans, Liverpool, and several Continental cities, and will commence operations in a very short time."

Western Trunk Lines Passenger Association.

Since the withdrawal of the Rock Island road, week before last, the Iron Mountain and the Missouri Pacific have given notice of withdrawal, the Missouri Pacific issuing the following circular Feb. 23:

"The agreement under which was issued the circular of Henry W. Gwinner, Commissioner of Western Trunk Lines, dated Jan. 1, 1881, announcing that from that date the commissions of this line on second-class and emigrant business would be paid by him on a percentage basis, having been this day canceled, you are hereby notified that the Missouri Pacific Railway Company will pay its commissions on that and all business direct to agents at the rates prevailing prior to Jan. 1, 1881. Our second-class and emigrant commissions for January will be paid without further delay, and all commissions remitted with our usual promptness in the future. But one statement of sales need hereafter be made, including all classes of tickets, which should be sent direct to this office. Your attention is respectfully called to the necessity of filling all columns of our commissions blanks, eqcept rate and amount, as per their headings, and especially to giving the through rates at which tickets were sold. Please use Missouri Pacific blanks in reporting to this company, if you have them."

Chicago-Colorado Shipments.

A difficulty that has made trouble before has appeared with regard to shipments of freight from Chicago to Colorado. There are three lines to Colorado west of the Missouri, one from Omaha and the other two from Kansas City. The Chicago & Northwestern has connection with the Omaha line only; the Rock Island and the Chicago, Burlington & Quincy with all lines; the Chicago & Alton with Kansas City only. The trouble is as to the share the Chicago & Northwestern shall have. The roads that connect with all the lines to Colorado claim that they are entitled to as much that goes by way of Omaha as any other road, and besides to a proportion of that going by Kansas City, and therefore to much more than a road that connects with only one of the lines to Colorado. The Northwestern, dissatisfied with its share of the business, is reported to have reduced the rates. To meet this the Rock Island gave notice to the Southwestern Association that it would not be bound by the rates on Colorado traffic and on the 23d reduced its rates in Colorado shipments from Chicago to the connections on the Missouri to 12½ cents per 100 lbs. on all the four classes, the regular rates being 85, 70, 45 and 30 cents. This is a matter not easy to settle without the cooperation of the Omaha pool and the Northwestern Association.

East Bound Classification.

By vote of the joint executive committee articles formerly put in the eleventh class (bulk meats and apples), are placed in the ninth class, on which the rates are usually 10 cents per 100 lbs. more than the flour and grain rate.

This makes the Chicago and New York rates as follows: First class, $1.20; second class, 90 cents; third class, 70 cents; fourth class, 60 cents; fifth class, 50 cents; sixth class, 45 cents; seventh class, 40 cents; eighth class, 35 cents; ninth class, 45 cents; tenth class, 35 cents; hogs, 40 cents; live stock, 65 cents; dressed beef, 88 cents, with agreed differences to other seaboard points.

Transfer Rates at St. Louis.

The railroads centering in St. Louis have just issued the following circular to agents and connections:

"The transfer across the Mississippi River by bridge or ferry at St. Louis is in many instances misunderstood by our Eastern connections.

"In quoting rates and issuing bills of lading for freight to St. Louis in any quantity that is desired to be delivered at consignee's door, the pound rate on general merchandise named in tariffs of St. Louis Transfer Company and St. Louis Bridge & Tunnel Company must be allowed as arbitrary, and the balance of rate prorated by the roads in interest.

"The limits of this free delivery by Transfer Company are the river on the east, Choteau avenue on the south, Fourteenth street on the west, and Cass avenue on the north.

"When the rate per car is allowed as an arbitrary it provides for delivery at Union Depot on track or by ferry on track, and way-bills should be made to read accordingly. All freight consigned to points beyond St. Louis, and rated to St. Louis or points beyond, should be billed to East St. Louis at full St. Louis rates, less the tolls named. It must be particularly understood that the toll charged for carloads provides for track delivery only, and should be so stated on all bills of lading."

Chicago Shipments Eastward.

The shipments by the pooled roads during the week ending Feb. 26 were as follows:

Railroads.	Flour, barrels.	Grain, tons.	Provisions, tons.	Total tons.	Per cent.
Michigan Central	22,952	7,907	2,881	13,083	28.6
Lake Shore	40,150	6,204	2,401	12,620	27.6
Fort Wayne	25,343	1,742	3,156	7,431	16.3
Pan-handle	14,690	2,097	2,697	6,262	13.7
Baltimore & Ohio	2,451	917	1,478	2,640	5.8
Grand Trunk	4,560	2,701	515	3,672	8.0
Total	110,146	21,568	12,158	45,708	100.0

For eleven successive weeks the total shipments have been:

Week ending:	Tons.	Week ending:	Tons.
Dec. 18	45,667	Jan. 29	54,689
" 25	51,396	Feb. 5	51,170
Jan. 1	41,807	" 12	49,449
" 8	49,367	" 19	46,180
" 15	54,935	" 26	45,708
" 22	51,075		

The receipts have thus fallen continuously (but not largely) for the past four weeks.

Chicago and Milwaukee Receipts.

During the month of February the number of bushels of grain, barrels of flour and head of hogs received at Chicago and Milwaukee in each of the past four years has been:

	1878.	1879.	1880.	1881.
Chicago:				
Grain, bush	4,776,021	5,264,951	5,308,561	4,057,134
Flour, bbls	286,343	279,438	178,940	432,410
Hogs, No	616,979	486,188	600,559	461,825
Milwaukee:				
Grain, bush	2,026,017	1,149,476	1,049,470	818,056
Flour, bbls	169,168	191,351	122,176	228,666
Hogs, No	85,988	41,454	62,452	37,169

Thus in grain and hogs the receipts were much smaller this year than in any of the other three, but in flour very much greater. The receipts of flour are enough larger to nearly make up for the falling off in grain, in equivalent breadstuffs, but not in weight. The frequent blockades of the Northwestern railroads by snow probably had very much to do with the decrease, and by as much as shipments were hindered by this cause in February they will be increased later in the season.

THE SCRAP HEAP.

Locomotive Building.

The Chicago, Rock Island & Pacific shops in Chicago have just finished six new shifting engines, with 15 by 24 in. cylinders.

The Pittsburgh, Ft. Wayne & Chicago shops in Allegheny, Pa., are building several heavy engines for use on the road.

The Pittsburgh Locomotive Works have a number of orders to fill and are full of work.

The Brooks Locomotive Works, in Dunkirk, N. Y., expect to turn out more engines this year than ever before, and have work for months ahead.

The Pennsylvania Railroad shops at Altoona built 85 new locomotives in the year 1880.

Car Notes.

Pennock Brothers have bought 10 acres of land in Minerva, O., and will soon build shops there for the manufacture of freight cars. They have an order for 300 cars for the Connotton Valley road.

The Missouri Car & Foundry Co. now employs over 500 men and is running its shops in St. Louis full time on freight cars.

New car works are to be built in Youngstown, O. The ground was bought by a subscription by the business men of the place, and given to the car builders.

The Harrisburg (Pa.) Car Manufacturing Co. now employs 700 men, and is working on an order for 1,550 freight cars for the New York Central.

The Boston & Albany shops at Allston, Mass., are building six very handsome sleeping cars, to run between New York and Boston. They are 60 ft. long, have 32 berths and are mounted on six-wheeled trucks with 42-in. wheels.

The Eastern Railroad shops at Salem, Mass., are building eight passenger and two baggage cars for the road.

The old car works at Swissvale, Pa., are now operated by John L. Gill, Jr., of Pittsburgh. They can turn out five freight cars a day.

The car-wheel works of Bowler & Co., in Cleveland, O., are full of work.

Bridge Notes.

G. W. White, of Pulaski, N. Y., has the contract for the bridge over French Creek in Meadville, Pa., for the new Meadville Railroad. It will be a Howe truss in three spans of about 100 ft. each.

Iron and Manufacturing Notes.

The Lochiel Mill, at Harrisburg, Pa., has taken a contract to roll a large lot of 45 lbs. steel rails from blooms to be furnished by the Pennsylvania Steel Co.

H. G. Newton, of New York, has recently filled several large orders for Lyon's Asbestos paint for railroad work.

The George F. Blake Manufacturing Co., of New York, has just completed large additions to its steam pump works, which were needed to meet the heavy demands upon the work. They have just finished building two large pumping engines for the La Crosse (Wis.) water works, and have contracts on hand for other water works.

The Portland Company, at Portland, Me., is building a beam engine with cylinder 72 in. diameter and 12 ft. stroke

for a new steamer which the International Steamship Co. is building.

The new furnace which Robert Hare Powell is building at Saxton, Pa., will be ready to go into blast about July 1 next.

The Superior Mill, in Allegheny City, Pa., is running single turn on iron and steel beams and other building materials.

The Cleveland Rolling Mill Co. will soon begin to build four very large blast furnaces in Cleveland, O., to be finished this year.

The Mahoning Valley Iron Co. has leased the Hubbard Rolling Mill at Youngstown, O., and have started it up.

The Cleveland Crucible Steel Co. is running full double time. The works are to be enlarged this season.

The Laclede Rolling Mills in St. Louis resumed operations Feb. 21, after a stop for repairs. They have large orders for bridge iron, boiler plate and rail fastenings.

A Louisville company has bought the furnace in Bibb County, Ala., near the Brierfield Iron Works, and will put it in operation at once.

The Rail Market.

Steel rails are steady at $60 to $62.50 per ton at mill. A sale of foreign steel rails is reported at $64 per ton delivered at a Gulf port.

Iron rails are unsettled, with many inquiries. Prices are a shade lower and about $47 per ton at mill for heavy sections may be quoted.

Old iron rails are unsettled, but prices have gone down. Quotations are nominally $28@$29 per ton in Philadelphia, but it is said that $1@$1.50 per ton less has been accepted for several large lots, and some predict a further fall.

Christian and Heathen.

The difference between a Christian and a heathen is not great. It merely consists in the following contrarieties:

In the rail car—

The Christian will leave the half seat that does not belong to him entirely unoccupied by himself or his parcels; while the heathen will do his best, or worst, to cover as much space as possible with either or both.

The Christian will be prompt to give a seat to a lady or elderly gentleman; while the heathen would do the same were he not so deeply absorbed in his newspaper or the panoramic view afforded by the window that he is unconscious of what is going on within the car.

The Christian will converse in a low tone, so as not to disturb the other passengers; whereas the heathen will make the newspaper reader in the far corner break the third commandment into infinitesimal fragments.

The Christian will be careful not to soil the floor, while the heathen will indulge his tobacco-chewing propensities to the uttermost, with all the nastiness that that propensity implies.

The Christian will never open his window of a cold day. The heathen, on the contrary, will shove hers clear up—we say hers, because this variety of heathen is inevitably a woman—when the thermometer is among the zeroes and the wind among the blizzards, and will sit placidly, muffled to the throat in her seal sacque, while the curses, not loud, but deep, flow through the quivering lips of those frozen things, the male passengers.

The Christian will have his ticket ready for the conductor when that patience-tried official comes through the car; the heathen will delay him for five minutes while leisurely making a tour of his pockets.

The Christian would no more think of stealing from the corporation than from a private person; but the heathen will cover his ticket with his thumb and become absorbed in his newspaper, for haply the conductor may think him a season passenger, and pass him by accordingly.

The Christian, finding one car crowded, will go into the next one, and take a seat; while the heathen will incontinently make for the full car, and stand up and growl consumedly.

The Christian will never make a nuisance of himself; but the heathen will every time, and never weary in doing it.

The Christian is a Christian; the heathen is a hog.—*Boston Transcript*.

Breaking of Tires.

At the meeting of railway engineers on Jan. 11, at Berlin, Mr. Streckert, the chairman, reported on the number of tires of railway carriages which, from Oct. 1, 1879, until March 31, 1880, were broken upon German lines. Thus, upon 45 different lines, with a total length of 32,316 kilometres [20,007 miles], no less than 5,039 breakages of tires had occurred. The maximum number took place at temperatures between zero and 6 deg. Cent. [+ 32 deg. and — 11 deg. Fah.] of frost, particularly during Dec. 9, 10, 17 and 23, 1879. Of the total breakages, 2,007 cases were upon goods trains, 1,466 upon express, fast and ordinary passenger and mixed trains, only 182 cases upon engines and carriages at the stations, or while shunting. Open goods carriages showed 1,626, and locomotives and tenders 1,580 breakages. As regards the material of which the tires consisted, in 3,269 cases it was cast steel, and only in 1,045 either puddled steel, fine-grained and ordinary wrought iron. In 3,545 cases the breakage went through the whole thickness of the tire, while in 1,045 others it was only partial. In reference to age it was proved that the greatest number appeared between six and eight years, while 1,104 breakages occurred with tires over eight up to 24 years old, and 1,905 were below six years. It is too well known that an unexpected breaking of tires while on the road very often causes a train to run off the rails and to give rise to accidents. For this reason the causes of breakages of tires ought to be fully investigated, whether arising from the material, construction, or mode of fastening. From the above figures it is obvious that cast steel is most liable to crack at low temperatures, when it is suddenly subjected to a heavy strain, for instance by the friction of brakes; this seems to be the principal reason with locomotives and tenders, as 1,580 tires were broken with them against 3,459 of all the wheels of the total rolling stock. It appears that the sudden production of heat by the friction of the brakes at the circumference of a comparatively cold wheel, is to be considered as the most mischievous cause.—*Engineering*.

OLD AND NEW ROADS.

Alabama Railroad Commission.—The bill establishing a railroad commission to have general supervision of the railroads of the state, with power to establish freight and passenger rates, has passed the Alabama Legislature and become a law. No copy of the bill has yet reached us, but it is stated that its provisions are very similar to those of the Georgia law.

Atchison, Topeka & Santa Fe.—Work is being pushed on the line to connect with the Southern Pacific, and at latest dates it was reported that but seven miles of track remain to be laid. This gap will probably be closed in another week.

Buckingham.—This company has been organized to build a railroad from Bremo Bluff, Va., to Buckingham Court House and thence to the most convenient point on the Atlantic, Mississippi & Ohio road. It will be a branch of the Richmond & Allegheny road, and is intended to reach the state quarries in Buckingham and Appomattox counties.

Canada & Atlantic.—A dispatch from Ottawa, Ont., Feb. 26, says: "At a meeting of the Canada & Atlantic Railway directors, held to-day, the contract for the construction of the road was finally signed by D. C. Lindsey, of Burlington, Vt., who guaranteed to build the entire road by 1883, a distance of 122 miles, as follows: From Coteau Landing to High Falls, by Jan. 1, 1882; between High Falls and Ottawa by Sept. 1, 1882, and the rest of the railway, exclusive of the bridging of the St. Lawrence, by May 1, 1883, and the bridge by May 16, 1887. The contractors deposited $30,000 cash, and a bond of $100,000 was made by Gregory Smith, of St. Albans, as security for the full completion of the contract."

Central Pacific.—In Washington, Feb. 24, the House Committee on Pacific Railroads adopted the following resolution:

"*Whereas*, The Attorney-General has commenced proceedings against the Central Pacific Railroad Company to compel a compliance with what is known as the Thurman act, and inasmuch as time will not admit of Congressional action at this session on the recommendation of the Auditor of Railroad Accounts; therefore, be it

"*Resolved*, That it is the sense of this committee that for the present no action be taken."

Charleston & Savannah.—The long trestle at the Savannah River bridge gave way under a train on Feb. 10, and nearly two miles of it was broken down, compelling a transfer of passengers. The work of rebuilding it was much delayed by high water, and trains were not able to run through until Feb. 25, when the damage was fully repaired.

Chicago, Pekin & Southwestern.—In Chicago, Feb. 22, the United States Circuit Court gave a decision in the foreclosure suit against this company. Two mortgages had been given by the company, one in 1871 for $1,000,000, and a second in 1876 for $750,000, securing corresponding issues of bonds for $1,000 each. The Farmer's Loan & Trust Company was the trustee under both mortgages. In 1877 the railroad made default in the payment of interest on both mortgages. The road was at that time in a very dilapidated condition, wanting rolling stock, etc., and the bondholders under the first mortgage under the circumstances agreed to advance 10 per cent. each on the amount of bonds held by them to purchase rolling stock and put the road in good condition. They also agreed to scale down their bonds from 8 per cent. to 7 per cent. interest, and to surrender three of the coupons.

With the money raised by the 10 per cent. advance rolling stock was purchased and put upon the road. All the bondholders of the first mortgage became parties to this agreement, and afterward the road paid interest on the bonds as the coupons fell due.

A controversy then sprung up between Mr. Moses Taylor, who owned over 300 of the first mortgage bonds and the whole of the second-mortgage bonds, and the other bondholders. Solon Humphreys, after this agreement made between the bondholders of the first mortgage and the company, had bought 671 of the first-mortgage bonds, but refused to take his interest which was due on his bonds and insisted that the first mortgage should be foreclosed, notwithstanding all the interest had been paid or offered to be paid on the bonds.

Judge Drummond held that the Court would retain the bill filed to foreclose the first mortgage, but would not make a decree of foreclosure at present. No interest whatever having been paid on the second-mortgage bonds, however, a decree of foreclosure and sale might be entered on the second mortgage, subject to all the equities of the first mortgage.

Receiver Reed reports to the Court for January as follows:

Balance, Jan. 1	$17,193.38
Receipts for the month	32,987 71
Total	$50,181.09
Disbursements	37,848.82
Balance, Feb. 1	$12,332.27

Disbursements exceeded the receipts by $4,681.11 for the month. Payments included $971.30 on old pay-rolls, and $5,000 for new freight cars.

Chicago, Rock Island & Pacific.—The following statement is published for the nine months of the fiscal year from April 1 to Dec 31:

Railroad earnings	$9,344,637
Land Department, cash receipts	370,000
Total	$9,714,637
Working expenses	5,0 3,556
Net balance	$4,711,081
Fixed charges	930,000
Balance applicable to dividends	$3,781,081

This balance is equivalent to about 9 per cent on the stock.

Dakota Southern.—Notice is given that 54 first-mortgage bonds have been drawn for redemption, and will be paid on presentation to the Farmers' Loan and Trust Company in New York. The numbers drawn are 44, 46, 57, 69, 71, 74, 86, 87, 89, 113, 117, 151, 161, 162, 170, 195, 196, 207, 208, 211, 231, 255, 288, 298, 301, 303, 318, 334, 335, 327, 342, 344, 390, 401, 403, 454, 462, 463, 466, 467, 468, 485, 488, 514, 515, 538, 546, 547, 551, 560, 574, 575, 580 and 581. Interest on these bonds will cease from May 20 next.

Delaware Western.—The bill authorizing this company to build extensions has passed the Delaware Legislature and become a law. It provides that the company shall have the right to extend from their present line southwesterly and just north of the town of Newark to the Maryland boundary, passing out of the state north of the point where the Philadelphia, Wilmington & Baltimore crosses the line, also to extend in a northeasterly direction to the Pennsylvania boundary. There are certain restrictions as to passenger fare and freight rates, and a state tax is fixed proportionate to that paid by the Philadelphia, Wilmington & Baltimore. The privileges granted become null and void unless the extensions be begun within one and finished within three years from the passage of the act. The act also authorizes the consolidation of the road with other roads connecting with it in Pennsylvania and Maryland, except in case the said roads already have a line running entirely across Delaware. Colonel McComb, the projector of the bill, was in Dover at the time of passage, and says he will at once enter into negotiations for the building of the new road from Baltimore to Philadelphia under the new law.

East Texas.—This road is now completed and opened for business to Concord, Tex., 10 miles north of the starting point at Beaumont. It is worked as a branch of the Texas & New Orleans. The freight tariff per 100 lbs. is as follows: First class, 15 cents; second, 14; third, 13; fourth, 12; class A, 11; class B, 10; class C, 9; class D, 8; class E, 7; cotton, 50 cents per bale.

Gulf, Colorado & Santa Fe.—The track is now laid to Belton, Tex., 226 miles from Galveston, and regular trains are running. The first through train reached Belton, Feb. 26, and left the next day on its return trip.

Jacksonville, Pensacola & Mobile.—The Savannah (Ga.) *News* of Feb. 24 says of this road and the Florida Central: "Both of these roads, under a decree of the Hon. Joseph P. Bradley, were sold at public outcry in the city of Jacksonville, on Sept. 25, 1879, by special masters appointed for that purpose. Both roads were knocked down to Adolph Engler, the representative of the complainants in the suit, who are commonly known as the Dutch bondholders.

"The highest bid for the Florida Central Railroad was $305,000, and for the Jacksonville, Pensacola & Mobile Railroad was $80,000. The first named railroad runs from Jacksonville to Lake City, and the other from Lake City to the Chattahoochee River.

"About ten days since the purchaser gave notice that he would move the Court in Jacksonville for an order confirming the sales. This motion, it appears, has been delayed for the reason that the case has been before the Supreme Court of the United States. The opinion of the Court affirming the decree rendered by Justice Bradley has been made public, but the formal mandate from the Supreme Court to the Circuit Court in Florida has not yet been issued.

"All the parties interested, with their respective solicitors and counsel, were present; but the case assumed an unexpected shape, owing to a motion filed in the Court by W. S. Chisholm, the counsel and solicitor of Henry S. Haines and associates, offering an advance of $95,000 on the former bid, and praying a resale of the Florida Central Railroad, for the reason that on Sept. 25, 1879, there was of force an order from Justice Bradley superseding his decree of sale, which with certain statements from one of the masters to the effect that in his opinion there would be no sale, deterred the movant and others from being present and bidding for the property.

"The motion for confirmation was withdrawn yesterday, and we understand it will not be renewed until after the mandate from the Supreme Court is filed in the Circuit. We have heard that parties interested with Adolf Engler have recently purchased the Atlantic, Gulf & West India Transit Railroad, which runs from Fernandina to Cedar Keys, and crosses the Florida Central at Baldwin; and that if the sale of Sept. 25, 1879, be confirmed, it will be their policy to run the three railroads in one interest."

Kentucky Central.—Proposals will be received at the office of J. R. Ledyard, Superintendent and Engineer, in Covington, Ky., until March 28, for the grading, masonry and bridging of the extension of the road from Lexington, Ky., to Richmond and from Richmond to Roundstone Junction; also from Paris to Winchester and from Winchester to Richmond. Separate bids must be made for the bridging on each section. Specifications and further information can be obtained at the office.

Lake Shore & Michigan Southern.—The Cleveland *Herald* says: "It is by no means a new idea that a tunnel passing from the Lake Shore on the eastern side of the city beneath the most traveled thoroughfares to a point on the Cuyahoga River from which railroad tracks to the west would not be objectionable, might at some day become absolutely necessary. The thing has been many times talked about in years past, but nothing has been done in the premises until recently. How far the agitation by some parties in this city to compel the railroad companies to expend half a million or more dollars in sinking the railroad tracks in the busiest part of the city has influenced action in this matter can only be conjectured.

"But whether for this reason or because of the advantages to be derived directly by the Lake Shore Railroad from the undertaking, surveys have been made for such a tunnel, which are now nearly completed, and which show very satisfactory results. It is already demonstrated that a tunnel beginning not far from the north end of Perry street and passing along or near the line of that street to an outlet 20 feet under grade, where it reaches the Cuyahoga Valley is both practicable and desirable. It can be constructed for somewhere between one and a half and two millions of dollars. It will pass under the principal thoroughfares of the east side of the city and emerge where the valley may be readily crossed on a bridge, and where the road may be continued westward, either by continued short tunneling or by a moderate rise in a neighborhood where a railroad is not at all objectionable. It will make the line through the city no longer than at present and bring down some heavy grades to one of only 16 ft. to the mile. If it is made, it will bring about other changes from the present order of things. It will take from the present tracks all through traffic and all passenger travel, and leave for them only the local freight business of the road, which is so small a part of the whole that it would hardly necessitate the costly outlay for lowering the tracks. If it should fail to end the clamor for such lowering, the present tracks might be abandoned and the local traffic brought down from the western end of the tunnel along the river by rails which would cross no traveled thoroughfare. In any event it would end the ever recurring clamor for lowering of the tracks, which has lost nothing apparently by the building of the viaduct, although that grand and costly improvement was supposed to have obviated the necessity for further changes in the railroad tracks. If the tunnel is made there will be a grand union depot built near where the railroad enters the tunnel at grade, say on Perry street, between Superior street and Payne avenue, an exceedingly eligible site, involving no expense in preparation for the building.

"The survey for this proposed tunnel is not the only one made for the Lake Shore road. Another made this side of Vermillion proves that the road can be so built as to bring down the grades to within 12 ft. per mile, and cut off 40 ft. grades. Still another survey shows the feasibility of a great improvement west of Toledo, which will save five miles in distance, and reduce grades of 40 ft. to 18 ft. per mile.

"It is too early as yet to say that the tunnel under Perry street will be made, because the surveys are not wholly completed, and of course no action has been taken upon them; but the idea of such a work has long been a favorite with many officers of the company, and the result of the investigation now made so far surpasses even their most sanguine opinions as to its feasibility and its cost, that they have the weight of the argument strongly upon their side, and unless all signs fail, we may expect before many moons to see Cleveland tunneled and a splendid new union depot built at Perry and Superior streets."

Lehigh & Hudson River.—The first contract for grading on this projected road has been let. It is from Belvidere, N. J., to Danville, and was taken by Richard Smith, of Parsippany, N. J. The section from Danville to Andover, on the Sussex road, will be let shortly.

Little Rock, Mississippi River & Texas.—The gap in the extension from Pine Bluff, Ark., to Little Rock was completed on Feb. 25, and regular passenger trains are now running between Little Rock and the Mississippi River terminus at Arkansas City, a distance of 114 miles. The company now has 151 miles of road, and its intention is to begin work on the extension of the Ouachita Division from Monticello westward.

Louisville & Nashville.—This company has been suffering severely from a freight blockade in the South, caused by floods and other causes, and has been compelled to issue the following order declining to receive freight until further instructions to points south of Chattanooga:

"Owing to the failure of its lines south of Chattanooga and east of Calera, and east of Montgomery, to return cars sent south by this company, they having now between 1,500 and 2,000 of our cars in excess of what we have of theirs, and all our efforts to have them returned having proved unavailing, we are compelled to give notice that until further notice this company will receive no freight for points south of Chattanooga, east of Birmingham, east of Calera and east of Montgomery. Freights for points on the line of the Louisville & Nashville and Nashville & Chattanooga railroads and west thereof, will be received at present. We hope that this course will result in the return of our cars in two weeks or less. Will advise you the very earliest moment that we are prepared to receive and handle freight for the territory described."

Minnesota State Railroad Bonds.—A dispatch from St. Paul, March 2, says: "The Senate has concurred in the House amendments to the bill providing for the payment of the repudiated bonds of the state incurred in railway construction. The Governor will sign the bill to-morrow. The bill is in the nature of an adjustment on the basis of 50 cents on the dollar, some of the claims being disputed. The payment is to be made out of the internal improvement lands. The repudiationists have asked the question as to whether this is not equivalent to voting a tax, which requires a two-thirds majority under the Constitution. It is a judicial rather than a legislative question, and may prove embarrassing if it should be combated in the courts. Those who have contended for the payment of the debt and are advised of the law and the facts do not seem disconcerted by the question. The repudiators have fought the adjustment plan at every turn with amendments and dilatory motions, 10 amendments being voted down in the Senate to-day."

New Bonds.—Bonds of new railroad lines are offered as follows:

The *Southern Maryland* will receive through the Guarantee Trust & Safe Deposit Company, of Philadelphia, and the Citizens' National Bank, of Washington, bids for $500,000 first-mortgage 6 per cent. bonds with 30 years to run. The road is now under construction from Brandywine, Md., to Drum Point, St. Mary and Point Lookout, 58 miles; 19 miles more, from Brandywine to Washington, are to be built hereafter.

The *Washington City & Point Lookout* offers, through A. W. Dimock & Co., of New York, its first-mortgage 6 per cent. bonds at 90; issue limited to $1,000,000. The projected line is from Washington to Point Lookout, Md., covering almost exactly the same ground as the Southern Maryland.

North Carolina Railroad Commission.—A bill now pending in the North Carolina Legislature provides for a Railroad Commission of three members, who are to have a general supervision of the railroads of the state, to receive complaints and act against companies which may violate the law. They are to have power to prescribe a uniform classification of freight and to divide the roads into three classes, in which passenger fares shall be 3, 3½ and 4 cents per mile respectively. The bill prohibits all discrimination in freight rates, especially exempting through freights, however, and permitting companies to make lower rates to or from one point than another by permission of the Commission. The bill provides for a tax of one mill per mile traveled by passengers, from which the expenses of the Commission are to be paid, any surplus to be turned into the treasury. It appears likely to pass.

Ogdensburg & Lake Champlain.—In the suit of this company against the Northern Railroad (New Hampshire) and others pending in the Circuit Court of the United States for the district of New Hampshire, Judge Lowell has handed down the following decision:

"The bill is brought upon the same contract which was under consideration by this Court in the District of Massachusetts in a case heard by Mr. Justice Clifford and myself, Ogdensburg & Lake Champlain Railroad Company *vs.* Boston & Lowell Railroad Corporation; we there gave a construction to this very singular and difficult contract, and hold that the four railroad companies who are its parties of the third part, had agreed, severally with the plaintiff corporation, to repay to it the large sum which it had advanced to the extent of the gross proceeds of the business in said contract mentioned and provided for; and only to this extent. The demurrer to the bill in that case was sustained because there was no allegation as to the amount of gross earnings, and because it did not appear that Smith and Stark, the trustees of the sinking fund, had no fund in their possession applicable to the payment of the debt. In the present case the bill has been amended to meet the objections which were sustained in the other case. The principal point made in support of the demurrer is that the Nashua & Lowell Railroad Company, against whom a separate suit is pending, being within the state of New Hampshire ought to have been made a party defendant.

"It was intimated in the former decision that if all four of the borrowing corporations had been found in one district a single suit might properly have been sustained against them; but we held that they were not necessary parties. The amended bill demands only one-fourth of the debt from this defendant, and if its gross earnings are equal to that sum I do not see that the other corporations are even proper parties to that inquiry. At all events, there is no advantage in joining two out of four of the accounting parties, each account being several and distinct. Demurrer overruled."

In the suit of the Nashua & Lowell Railroad Company, Judge Lowell holds "that the bill in this case is like that passed upon in Ogdensburg & Lake Champlain Railroad Company *vs.* Boston & Lowell Railroad Corporation, and has not been amended to meet the objections sustained in that case. The order must therefore be, demurrer sustained."

Pennsylvania.—This company's statement for January shows for all lines east of Pittsburgh and Erie, as compared with the same month last year:

An increase in gross earnings of (3.4 per cent.)	$105,664
An increase in expenses of (15.4 per cent.)	265,101
Net decrease (11.7 per cent.)	$159,437

For the month all lines west of Pittsburgh and Erie show a surplus over liabilities of $381,539, being a gain of $80,712 over the same month last year.

Mr. J. K. Cowen, attorney for the Baltimore & Ohio, has brought suit against the Pennsylvania Railroad Company for $1,000,000 damages, in the Superior Court at Baltimore. The cause of action is the interruption of travel and delay of passenger and freight trains at the junction in Philadelphia on the New York route of the Baltimore & Ohio Railroad. Suits have been brought against the Baltimore & Ohio Railroad for damages for delay at the same point in transporting cattle and causing them to miss a higher market than the prices when the train reached New York. In the same court Nathan Lehman and Abraham Lehman, Lewis Myers and William Houseman, and Jacob Ellinger and Henry C. Seymour, have respectively brought three suits against the Pennsylvania Railroad Company for $5,000 each damages for loss on cattle.

Philadelphia & Reading.—A cross-fire of circulars and appeals to stockholders is kept up by the opposing parties, and will doubtless continue up to the day of election.

The Masters have reported to the Court as follows for January:

Balance, Jan. 1	$71,957.78
Receipts for the month	2,413,774.44
Total	$2,485,732.22
Payments for the month	2,168,274.91
Balance, Feb. 1	$317,457.31

Among the receipts filed in a separate account is an item of $156,136.23 paid as installments on deferred income bonds. This account is kept separate under order of the Court, so that if the scheme fails the money can be paid back to subscribers without diminution. The balance credited to the Coal & Iron Company for the month is $140,792.35.

Another bill in equity has been filed by the McCalmonts' attorneys, praying that Franklin B. Gowen may be restrained from voting in the right of any shares which stand in the name of the company defendant, or in the name of any person or persons who hold the same in trust for the company, or in the right of any shares belonging to the company defendant which have been pledged as collateral securities for any debt due by the company, and have been transferred into the name of any creditor or creditors of the company, or into the name of any other person or persons to hold on their behalf, and particularly from voting by virtue of any proxy heretofore given in the right of 1,000 shares of stock of the company now standin the name of Samuel R. Shipley, which were pledged by the Railroad company to the Provident Life & Trust Company. Before failure the company had pledged large numbers of its shares as security for money borrowed, transferring them on the books to the creditors, from whom Mr. Gowen has obtained and is still obtaining proxies. The 1,000 shares in the name of Samuel R. Shipley, President of the Provident Life & Trust Company, were collateral for a loan of that corporation to the Reading, and it is alleged that Mr. Shipley has executed a proxy entitling Mr. Gowen to vote upon those shares, although they are the property of the company. The McCalmonts claim that these shares cannot legally vote, and that it is particularly illegal for a president to use them to re-elect himself. The Court has fixed March 9 for a hearing on this bill.

Philadelphia, Wilmington & Baltimore.—The negotiations in relation to the future of this road do not appear to be completed yet, though the main fact of the transfer of the controlling interest is settled. A number of the Boston stockholders have signed a power of attorney, constituting Henry P. Kidder, C. W. Cotting, Henry L. Higginson, Charles P. Cowditch and Wm. Minot, their attorneys, with power to sell and transfer their stock.

Portland & Ogdensburg.—The Boston *Advertiser* says: "The directors of the Portland & Ogdensburg Railroad have transferred to the city of Portland all mortgage bonds of the road held as collateral, upon the surrender of the stock of the company, also held in security by the city, and the discharge of the bond of the company to the city. This gives to the city a perfect title to $1,350,000 of the stock of the road, and it also owns about $350,000 more in it. The city now has sufficient stock to control the management, and will fight the equity suit of the Mercantile Trust Company of New York, which wants the New Hampshire portion of the road covered by a mortgage to secure the $80,000 worth of bonds held by them."

Red Wing & Iowa.—This company has been organized at Red Wing, Minn., to build a railroad from that town to the Iowa state line to connect with projected lines in Iowa.

St. Louis & Eastern.—This company has filed articles of incorporation in Illinois to build a railroad from East Carondelet southeast to Georgetown in St. Clair County, about 18 miles, with such short branches as may be required. The object is probably to reach coal mines.

St. Louis, Iron Mountain & Southern.—At the annual meeting in St. Louis, March 1, the stockholders voted to authorize the proposed increase of capital stock to $35,000,000; also the proposed funding of all the indebtedness of the company in consolidated mortgage bonds, and the use of a part of such bonds to lay the road with steel rails.

St. Louis & San Francisco.—In St. Louis, March 1, the stockholders voted to authorize the issue of consolidated bonds not to exceed $30,000,000 in amount and 6 per cent. in interest, to be used to fund all the existing debt; the surplus to be used for building new lines and branches.

Sauk Centre & Northern.—This company has been organized to build a railroad from Sauk Centre, Minn., northerly to some point on the Northern Pacific between Motley and Perham; capital stock, $1,000,000.

Syracuse, Chenango & New York.—Certain stockholders have obtained a temporary injunction to restrain the transfer of this road to the Burt syndicate, which has lately bought a two-thirds interest. Argument is to be heard shortly on a motion to make the injunction permanent.

Terre Haute & Mississippi.—This company has filed articles of incorporation in Indiana for a railroad from Terre Haute southward to a point in Sullivan County, Ind. The object apparently is to connect with the Springfield, Effingham & Southeastern road.

Troy & Greenfield.—A bill has been reported favorably to the Legislature to authorize the Supreme Court to take jurisdiction on the petition of the old Troy & Greenfield Company, and to decide what amount the company must pay to redeem the road and the Hoosac Tunnel from the state.

Utah & Nevada.—The bondholders who bought the Utah Western road at foreclosure sale in August last have organized this company, which will take possession of the road at once. It is now in operation from Salt Lake, Utah, to Terminus, 37 miles; the new company purposes extending it to Tanner's Springs in Tintic Valley, 87 miles from Salt Lake.

West Virginia Railroad Regulation.—The so-called Wilson bill to regulate rates and prevent discrimination, which last week passed the West Virginia House, has been rejected by the Senate.

ANNUAL REPORTS.

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Ohio & Mississippi.

This company owns a line from Cincinnati to East St. Louis, 340 miles, with a branch from North Vernon, Ind., to Louisville, 53 miles, and the Springfield Division from Shawneetown, Ill., to Beardstown, 222 miles, making 615 miles in all. The property has been worked since Nov. 17, 1876, by John King, Jr., as Receiver under the United States Circuit Court, and the following statements are from his report to the Court for the year 1880:

The earnings of the Main Line and Louisville Branch, 393 miles, for the year were as follows:

	1880.	1879.	Increase.	Pc.
Passengers	$1,139,370	$929,681	$209,689	22.6
Freight	2,909,673	2,284,023	625,650	27.4
Mail and express	230,291	191,181	39,110	20.5
Total	$4,279,334	$3,404,885	$874,449	25.7
Less transfers	345,891	264,761	81,130	30.6
Gross earn.	$3,933,443	$3,140,124	$793,319	25.3
Expenses, less transfers as above	2,694,465	2,084,927	609,538	29.2
Net earn.	$1,238,978	$1,055,197	$183,781	17.4
Gross earn. per mile	10,009	7,990	2,019	25.3
Net " " "	3,153	2,685	468	17.4
Per cent. of exps.	68.51	66.40	2.11	.....

The amount charged during the year for improvements was $474,084, of which the sum of $386,161 was for steel rails. There are now only five miles of track with old iron rails, and these will be relaid with steel this year.

The earnings of the Springfield Division, 222 miles, were:

	1880.	1879.	Increase.	P. c.
Gross earnings	$442,867	$362,116	$80,751	22.3
Expenses	425,136	365,894	59,242	16.2
Net earn.	$17,731	.....	.....	.....
Deficit	.....	$3,778	.....	.....
Gross earn. per mile	1,995	1,631	$364	22.3
Per cent. of exps.	96.00	101.49	.....	.....

On this division the sum of $57,152 was spent for improvements, $42,840 being for rails. The total net earnings of all lines were $1,256,709, against $1,051,419 in 1879.

The condition of the floating debt is as follows:

Unpaid Dec. 31, 1879		$447,973
Claims anterior to Nov. 18, 1876, audited	$85,076	
Less collected on old account	748	
		84,329
Total		$532,301
Paid during the year		199,936
Unpaid, Dec. 31, 1880		$332,365

The floating debt as recognized due Nov. 18, 1876, was $1,401,736, to which should be added amounts since audited, less amounts collected in final settlements, $162,470, making $1,576,203, of which only $332,365 remain unpaid. There are also outstanding debenture bonds of the company, unsecured, which will mature May 1, 1883, to the amount of $140,000, upon which eight coupons are due and unpaid to the amount of $39,200.

The sinking fund for the first-mortgage bonds, the annual payments to which are now $144,000 in arrears, the Receiver says exists under a contract made in 1872 between the company, the trustees under the first mortgage, and the Union Trust Company—the latter as Special Trustee of the sinking fund then created; and while the payment of these annual contributions is not secured by any lien under the first mortgage, the liability of the company for the same is not to be overlooked in any final adjustment of the company's debts.

The first-mortgage coupons due in 1880 were paid; the second-mortgage coupons due Oct. 1, 1879, were paid April 1, 1880; the coupons due April 1, 1880, were paid at maturity; the coupons due April 1, 1877, were paid Nov. 1, 1880; the coupons due Oct. 1, 1880, were paid Nov. 1, 1880; the first-mortgage Springfield Division coupons of May 1, 1877, were paid Nov. 1, 1880; the coupons due Nov. 1, 1877, were paid Nov. 1, 1880; the first coupons due Nov. 1, 1880, were paid at maturity. The interest on the Western Division bonds, income Western Division bonds and funded debt bonds, was paid at maturity.

The amount due and unpaid Dec. 31, 1880, for coupons and for sinking funds on mortgage bonds was as follows:

Four coupons on second-mortgage bonds	$536,480
Five coupons on Springfield Division bonds	348,075
Four appropriations to sinking fund of first-mortgage bonds	144,000
Eight appropriations to sinking funds of second-mortgage bonds	132,000
Total	$1,160,555

The Receiver's report says: "In 1876 and 1877 the net earnings of the entire road were not sufficient to pay the fixed charges. During 1880 the fixed charges for interest upon the bonded debt, including the Springfield Division bonds outstanding, amounted to $889,630. The net earnings were $1,256,709, showing the surplus earnings over the fixed charges (exclusive of interest on debentures) to have been $367,079, notwithstanding the amount ($531,236) charged during the year for the improvement of the properey.

"During the past year the petition of George Henry Warren, Edward H. Green and others, holders of preferred stock, to have such stock declared a prior lien on the property of the road in advance of the second-consolidated mortgage, and the accumulation of interest, at the stipulated rate of 7 per cent. per annum upon such preferred stock, paid before any further payments of second-consolidated mortgage interest, was fully argued before his Honor, Judge Drummond, at Chicago, and decided by him in favor of the claim of the priority of the second-consolidated mortgage, and against the preferred stockholders. An appeal has been taken from this decision to the Supreme Court of the United States, at Washington City, where the matter in controversy will be finally disposed of, it is supposed, in about two years. The total amount of preferred stock is $4,030,000. The accumulated interest thus claimed amounts to more than $1,800,000. This large amount claimed by the preferred stockholders

makes the question of their priority over the second-consolidated mortgage bondholders, if decided adversely to the latter, one of great importance to the company, and one which may involve the company in serious financial difficulty. And this contingency, while not regarded as probable, in view of Judge Drummond's very carefully considered opinion, is, nevertheless, among the possibilities of the future, without reference to which it would be unwise to take any decided action in formulating a programme for the extrication of the company from its embarrassments.

"I also add that the suit brought by F. P. Dimpfel and others, to cancel the sale of the Springfield Division, has been appealed to the Supreme Court of the United States, and is there pending, and thus the additional possibility is involved of the loss of this valuable branch, with the liability of being subjected to an account for rents and profits, and of disbursements for repairs and improvements covering the period of occupation."

Marietta & Cincinnati.

This company owns a line from Cincinnati & Baltimore Junction, just outside Cincinnati, to Belpre, 188 miles, with a branch from Belpre to Marietta, 11.1 miles; the Scioto & Hocking Valley Branch, Hamden to Portsmouth, 55.4 miles and a branch from Blanchester to Hillsboro, 21.4 miles, making 275.9 miles owned. It leases the Cincinnati & Baltimore, 5.8 miles, which forms the entrance into Cincinnati, and the Baltimore Short Line, which is a loop 30.3 miles long near the eastern end, and which is used as the main line, the old line being practically abandoned. This makes 312 miles in all. The road has been in the hands of a receiver since June 27, 1877, and the following statements were made by him at the recent annual meeting.

The gross earnings from Nov. 1 to Dec. 31, 1879, were $345,915; for the year 1880 they were $2,101,720, or $6,736 per mile.

The income account for the 14 months from Nov. 1, 1879, to Dec. 31, 1880, was as follows:

Gross earnings ($7,845 per mile)		$2,447,634.70
Working expenses (86.59 per cent.)		2,119,501.02
Net earnings ($1,052 per mile)		$328,133.68
Taxes	$82,813.31	
Rent, Cincinnati & Baltimore	143,174.05	
" Baltimore Short Line	228,526.50	
" Cin., Ind., St. L. & Chi. tracks	7,495.00	
" of depots, etc., in Cincinnati	40,666.88	
Coupons, Scioto & Hocking Valley bonds	31,645.00	
Miscellaneous charges	4,192.11	
		538,512.85
Deficit		$210,379.17

This deficit, it will be observed, does not include any interest upon the bonded debt, except upon the bonds of the Scioto & Hocking Valley Branch. The bonds are a first lien upon the branch, and interest is doubtless paid in order to prevent a separate foreclosure. The large rentals paid for the Cincinnati & Baltimore and the Baltimore Short Line roads absorbed more than the net earnings.

By the latest statement the bonded debt (exclusive of the $300,000 Scioto & Hocking Valley bonds) consisted of $3,500,000 first-mortgage 7 per cent. bonds; $2,500,000 second-mortgage 7 per cent. bonds; $3,000,000 third-mortgage 8 per cent bonds and $4,000,000 fourth-mortgage 8 per cent. bonds, a total of $13,000,000, with an annual interest charge of $980,000. The arrearages on account of interest during the receivership are as follows: Coupons—six first mortgage at $122.500, total $735,000; seven second mortgage at $87,500, total $612,500; eight third mortgage at $120,000, total $960,000; seven fourth mortgage at $160,000, total $1,120,000; grand total, $3,427,500. The Baltimore & Ohio is a large owner of the bonds and also of the stock.

Chicago & Alton.

Advance sheets of the report of this company for 1880 reach us too late for extended summary or comment this week.

The lines operated included 840.46 miles, as at the close of 1879. There are 62.62 miles of second track and 158.45 miles of sidings, an increase of 0.56 mile second track and 20.57 miles of sidings. There are 728.51 miles laid with steel, an increase of 72.95 miles.

The equipment consists of 207 locomotives, 105 passenger-train cars and 5,383 freight cars, an increase of 20 locomotives, 10 passenger-train cars and 1,165 freight cars.

The stock and debt are as follows:

Preferred shares	$2,425,400
Common shares	11,181,400
Convertible scrip outstanding	72
Total amount of bonds	12,981,950
Total stock and bonds	$26,588,822

The amount of common capital stock has been increased 11,160 shares, which have been sold by the company for the purpose of providing additional equipment, and the amount of bonded indebtedness has been reduced by the cancellation of $61,000 of sinking fund bonds since the date of the last annual report.

The company has expended large sums obtained from time to time by the sale of its stock and bonds for permanent additions to its leased lines and for rolling stock used on them.

The leases are perpetual, and the property thus held may be considered as owned, subject to the payment of annual rent.

The traffic for the year was as follows:

	1880.	1879.	Increase.	P.c.
Passengers carried	1,203,549	843,429	360,120	42.7
Passenger mileage	78,270,565	54,215,073	24,051,492	44.4
Tons freight carried	3,071,788	2,634,177	437,611	16.6

In operating the lines 230,111 tons of coal and 5,885 cords of wood were consumed. The average number of men employed was 4,108, against 3,589 in 1879.

The earnings for the year were as follows:

	1880.	1879.	Increase.	P.c.
Passengers	$1,624,668.08	$1,311,708.17	$312,959.91	23.9
Freight	5,808,484.30	4,242,791.39	1,565,692.91	36.4
Express, mail, etc	254,073.60	201,177.63	52,895.97	26.3
Total	$7,687,225.98	$5,755,677.10	$1,031,548.79	33.6
Expenses	4,061,823.74	3,049,520.63	1,912,303.11	33.2
Net earnings	$3,625,402.24	$2,706,156.56	919,245.68	34.0
Gross earn. per mile	9,146.45	7,313.44	1,833.01	25.1
Net earn. per mile	4,313.59	3,438.57	875.02	25.4
Per cent. of expenses	52.84	52.98		

The leased lines all show an increase in gross earnings for the year.

The operation of the leased lines during the last year has afforded a continued demonstration of their great value to the company.

During the last year $1,133,124.57 was expended for additional depot grounds, building, side tracks, locomotives and cars, of which sum $1,116,441.23 was derived from the sale of 11,160 shares of the common capital stock of the company, and the balance, amounting to $16,683.34 was paid from income account.

The report of President Blackstone says: "The condition of the property of the company has been, in all departments, fully maintained during the last year, and in many respects greatly improved. There now remains on the lines between Chicago and Kansas City, Chicago and St. Louis, and St. Louis and Kansas City, only 38.38 miles of iron rails in main tracks, all of which will be replaced with steel rails, now under contract, to be delivered early in 1881. Contracts were made last year for the erection of 22 iron bridges, to take the place of an equal number of wooden ones, but by reason of unexpected delays, only part of that number were completed at the close of the year.

"The substitution of steel and iron for wood in bridges has been continued until very few bridges of wood now remain on our lines.

"The work of reducing the inclination of the steepest grades on the several divisions of the road has been continued during the last year, and has been completed on the division between Chicago and Bloomington, 126 miles. The maximum inclination of grades on that division, in the direction of the largest traffic, is now 24 feet per mile.

"This improvement will be of great value in reducing the cost of transportation. Considerable work of the same kind has been done during the last year between Louisiana and Mexico."

Pennsylvania Railroad.

The report of this company for 1880 covers, as usual, the lines worked directly, which are as follows:

1. The Pennsylvania Railroad Division, including the main line from Philadelphia to Pittsburgh, 358 miles, with 762 miles of branches, 1,120 miles in all; an increase of 27.5 miles of branches.

2. The United Railroads of New Jersey Division, including the main line from Jersey City to Philadelphia, 89 miles, and 313 miles of branches; also the Delaware & Raritan Canal, 66 miles, in all 402 miles of railroad and 66 of canal; a decrease of 23.5 miles caused by the abandonment of the Mercer & Somerset road.

3. The Philadelphia & Erie Division, a main line from Sunbury, Pa., to Erie, 288 miles.

The earnings and expenses of these lines for the year were as follows:

I. PENNSYLVANIA RAILROAD DIVISION.

	1880.	1879.	Inc. or Dec.
From general freights	$20,234,046.44	$17,016,988.65	I. $3,217,057.79
From miscellaneous freights	278,347.54	285,016.47	D. 6,668.93
From first-class passengers	4,110,797.68	3,336,798.29	I. 773,999.39
From emigrant passengers	326,348.97	216,408.79	I. 109,940.18
From Adams Express	351,812.06	309,798.43	I. 42,013.63
From carrying U. S. Mails	371,276.56	352,152.89	I. 19,123.67
From miscellaneous passengers	99,742.59	75,065.73	I. 24,676.86
From rents	215,285.78	151,399.06	I. 63,886.72
Total	$25,987,657.62	$21,743,628.31	I. $4,244,029.31
For conducting transportation	$5,319,345.75	$4,751,993.95	I. $567,351.80
For motive power	4,003,728.41	3,235,491.94	I. 768,236.47
For maintenance of cars	1,805,747.07	1,425,464.05	I. 380,283.02
For maintenance of way	2,488,729.18	1,971,503.41	I. 517,225.77
For general expenses	433,935.37	367,167.20	I. 66,768.17
Total	$14,051,485.78	$11,751,620.55	I. $2,299,865.23
Net earnings	$11,936,171.84	$9,992,007.76	I. $1,944,164.08

II. UNITED RAILROADS OF NEW JERSEY DIVISION.

	1880.	1879.	Inc. or Dec.
From general freights	$6,385,410.17	$4,894,941.91	I. $1,490,468.26
From miscellaneous freights	132,338.36	106,309.03	I. 26,029.33
From first-class passengers	4,101,582.05	3,645,196.49	I. 456,385.56
From emigrant passengers	60,930.85	40,846.11	I. 20,084.74
From Adams Express	265,093.49	235,064.82	I. 30,028.67
From carrying U.S. mails	136,598.25	131,128.04	I. 5,470.21
From miscellaneous passengers	43,298.00	35,397.55	I. 7,900.45
From Delaware & Raritan Canal	419,430.57	695,959.10	D. 276,528.53
Total	$11,544,681.74	$9,784,843.05	I. $1,759,838.69
For conducting transportation	$4,090,060.71	$3,101,264.92	I. $988,795.79
For motive power	1,757,604.26	1,453,723.38	I. 303,880.88
For maintenance of cars	526,004 72	454,953.59	I. 71,051.13
For maintenance of way	1,440,154.43	1,104,016.12	I. 336,138.31
For general expenses	70,040.36	59,978.67	I. 10,061.69
For canal expenses	331,343.53	326,924.85	I. 4,418.68
Total	$8,215,208.01	$6,500,861.53	I. $1,714,346.48
Net earnings	$3,329,473.73	$3,283,981.52	I. $45,492.21

III. PHILADELPHIA & ERIE DIVISION.

	1880.	1879.	Inc. or Dec.
From general freights	$3,130,835.38	$2,589,029.65	I. $541,805.73
From miscellaneous freights	97,494.54	93,689.13	I. 3,805.41
From first-class passengers	424,674.84	336,994.97	I. 87,679.87
From emigrant passengers	6,080.75	3,371.81	I. 2,708.94
From express	31,582.68	31,276.29	I. 306.39
From carrying U. S. mails	26,481.45	26,507.59	D. 26.14
From miscellaneous passengers	10,583.49	10,938.37	D. 354.88
Total	$3,727,733.13	$3,091,807.81	I. $635,925.32
For conducting transportation	$763,017.27	$665,773.28	I. $98,143.99
For motive power	703,477.00	635,127.21	I. 68,349.79
For maintenance of cars	274,425.50	223,563.03	I. 50,862.47
For maintenance of way	616,534.01	605,704.55	I. 10,739.46
Total	$2,358,353.78	$2,130,258.07	I. $228,095.71
Net earnings	$1,369,379.35	$961,549.74	I. $407,829.61

A summary of the income account is as follows:

Net earnings, Penn. R. R. Div., as above		$11,936,171.84
Interest from investments		2,903,669.31
Interest on equipment, branch roads		243,549.76
Balance of interest account		285,799.33
Royalties on coal, Mineral R. R. & Mining Co	$99,790.80	
Less depreciation of coal lands	28,276.05	
		71,523.84
Profits from sale of securities, etc.		21,203.80
Empire Line, net earnings	$403,128.39	
Less tax and car trust payments	123,123.33	
		280,005.06
Total Penn. R. R. Div		$15,741,922.94
Rentals of branch roads	$921,503.56	
Interest on equipment, branch roads	50,105.35	
Rent, Harrisburg & Lancaster R. R.	130,917.43	
Interest on bonded debt	3,572,148.00	
Interest to state on purchase of main line	201,391.08	
Interest on car trusts	482,156.69	
Interest on mortgages, and ground-rents	87,748.26	
Premium, exchange, etc	3,421.71	
State tax on dividends	241,045.70	
		5,690,427.78
Net income, Penn. R. R. Div		$10,051,485.16
Net earnings, United R. R. of N. J	$3,329,473.73	
Interest in cash from investments	192,384.24	
Total	$3,521,857.97	
Dividends, interest, etc	4,524,021.90	
Interest on Bel. Del. equipment	33,144.94	
Total charges	$4,557,166.84	
Net loss on New Jersey lease		1,035,308.87
Balance remaining		$9,016,176.29
Net earnings, Phila. & Erie	$1,369,379.35	
Interest on equipment	162,200.47	
Extraordinary charges	106,567.08	
Total charges	$268,767.55	
Net income, Phila. & Erie	$1,100,611.80	
Paid Phila. & Erie Co. as rental	1,100,611.80	
Balance from operating roads		$9,016,176.29
Payments to trust fund of Oct. 9, 1878, for purchase of securities	$600,000.00	
Consol dated mortgage bonds redeemed	291,000 00	
Northern Central, one-half loss on leases	27,423.37	
Balt. & Potomac, advances	29,459.10	
Shamokin Coal Co., "	7,000.00	
Phila. & Erie "	25,574.81	
Allegheny Valley "	332,150.00	
Sunbury, Hazleton & W., advances	50,000.00	
Frederick & Pa. Line "	15,000.00	
		1,377,607.28
Balance of income		$7,638,569.01
Dividends, 7 per cent		4,820,914.00
Balance to credit of profit and loss		$2,817,655.01
Settlement of old accounts and profit on sale of securities		795,220.37
Balance of profit and loss, Dec. 31, 1879		4,181,073.33
Balance, Dec. 31, 1880		$7,775,948.71

It will be noticed that the gross earnings of each of the respective divisions show a closely corresponding increase, and that the expenditures of the Pennsylvania Railroad Division proper and the Philadelphia & Erie Railroad Division bear a fair relative proportion thereto, leaving a gratifying increase of net profit from the greater volume of business. On the New Jersey Division, however, the increased cost has been almost equal to the increased revenue. This is largely due to the continued expenditures required to replace in a more efficient shape the temporary structures and old equipment formerly upon that line. In addition to this it must be borne in mind that upon that division rests the burden of providing exceptionally expensive facilities for the large volume of traffic concentrated upon it from the Main Line and your extensive system of tributary roads and also as the connecting link between the two most important cities of the Union, of furnishing to the public the highest standard of passenger service. It may be reasonably hoped, however, that with these improvements the continued increase of traffic which must be developed upon so important a line will gradually yield a more satisfactory result.

CONSTRUCTION.

The amount expended for construction, equipment and real estate during the year were as follows:

Construction:			
Pennsylvania R. R.		$1,942,804.54	
United R. R. of New Jersey		667,611.14	
			$2,610,415.68
Equipment:			
Freight and passenger cars, tools and machinery	$ 696,671.47		
Steamboats	78,500.00		
Car floats	74,000.00		
		$849,171.47	
Less amount received from Allegheny County for equipment destroyed in July, 1877		504,275.00	
			344,896.47
Real Estate:			
Pennsylvania R. R.		$1,020,596.43	
United R. R. of New Jersey		141,250.50	
			1,161,846.93
Improvements and extensions of branch and connecting roads			760,794.71
Total			$4,877,953.79

Against the above charges the following credits were made:

Construction:		
Pennsylvania R. R., cash from sales of property	$364.00	
United R. R. of N. J., proceeds sale of property, principally old equipment	191,626.80	
United R. R. of N. J. stock, received on account of Harsimus improvement	339,991.20	
Real Estate:		
Pennsylvania R. R., by property sold, principally Bryn Mawr lots	20,000.00	
Value of United R. R. of N. J. stock, received on account of Harsimus improvement	60,008.80	
	$611,990.89	
By amount charged to branch roads, as above	760,794.71	
		$1,372,785.60
Balance, being net increase on Penn. R. R. and United R. R. of N. J. in construction and equipment account during 1880		$3,505,168,19

It will be noticed from this statement that the amount ex-

pended for new work upon all of the lines east of Pittsburgh and Erie during the past year, charged to capital account, was larger than usual. This was due to the necessity for providing new and additional facilities to properly take care of the increase of traffic consequent upon the unusual prosperity of the country.

The most important items of this construction account were as follows:

1. The completion of the elevator and construction of the adjacent dock facilities at Harsimus Cove. This elevator is a most substantial structure, and will aid materially in the economical handling of grain at the New York terminus.

2. The purchase of additional property on the New Jersey leased lines.

3. Straightening the line through the expensive trap-rock cut near Jersey City. This work, begun several years since, has been steadily continued, the materials taken therefrom being used principally in ballasting the New York Division. A portion of the straightened line has already been brought into use, and during the present year an additional section will be completed. This will materially improve the alignment and give additional track facilities so much required in approaching Jersey City.

4. At Philadelphia, completing the docks and piers on the old Navy Yard property, and the line on the west bank of the Schuylkill River connecting the main tracks in West Philadelphia with the Delaware Extension.

5. Improving and straightening the Main Line between Philadelphia and Lancaster, especially at the point known as the Valley Creek Bridge.

6. The largest item of construction expenditure represents the work done during the past year on the Filbert Street Extension, which will be more fully referred to in a subsequent part of the report. This work, which was started at the date of the last annual report, has since been vigorously prosecuted. The approach across the yard tracks in West Philadelphia, the iron bridge over the Schuylkill River and the iron approaches thereto, together with all the brick arches and nearly all the street bridges, are completed and the tracks partially laid thereon. It is expected that it will be finished so as to be brought into use the coming summer.

7. The important structure at Pittsburgh, known as the Hospital Bridge, erected for the purpose of carrying Twenty-eighth street over the yard tracks at that point, has been completed.

Some additional improvements and side tracks were made upon the Philadelphia & Erie Railroad, costing about $100,000, which is deemed advisable to charge to the extraordinary expenses of the company.

The amount charged to real estate was expended mainly for the purchase of property for the Filbert Street Extension. This amount is larger than was contemplated when the work was projected, it having been thought advisable to purchase additional property, which will be needed for the uses of the company, before it should be permanently improved, and its acquisition thus made more expensive. The construction of this extension having interfered with the large warehouse and office of the Adams Express Company, used in connection with your lines, it was deemed advisable that the company should acquire their ownership; this has been done on favorable terms, that company continuing to use the property and paying rent therefor.

The expenditures for account of branch roads were principally upon the Southwest Pennsylvania Railway, the extensions of the Lewisburg & Tyrone Railroad and of the Pittsburgh, Virginia & Charleston Railway and in the completion of the branch to West Chester.

The expenditures for equipment represent the construction of 50 new passenger cars, the purchase of the outstanding certificates in the Oil Tank Car Trust, and the acquisition of the tugs and barges of the National Lighterage Company at the port of New York.

During the year 1881 the outlay for new construction and equipment will probably be quite as great as for the past year. Additional improvements must be promptly made, and your properties fully maintained in order to provide for the continually increasing traffic and to meet the activity of competitive routes. This matter will be more fully referred to hereafter.

The debt due to the state of Pennsylvania on account of the purchase of the Main Line was reduced during the year by the payment of $258,608.92, which was charged to capital account; the balance of the annual payment of $465,000 ($201,391.08), representing the interest upon the amount due to the state, was charged directly to income account.

Under the provisions of the consolidated mortgage of the company, there was set apart on July last, out of the net income, the sum required for the purchase of outstanding bonds secured by that mortgage and entitled to the security of the covenants therein in relation to the sinking fund. Bonds to the par value of $291,000 were thus purchased, and after being canceled were delivered to the trustees under the stipulations of said mortgage; this reduction appears in the Treasurer's general account. The amount of bonds so purchased to date is $639,460 at their par value.

In the last annual report reference was made to the maturity, Dec. 31, 1880, of $4,570,000 of the first-mortgage bonds of the company, and to the provision made by your board of directors for payment of the same. On the date referred to, bonds to the amount of $2,867,000 were paid off and canceled, leaving $2,103,000 then outstanding, which amount has since been reduced to $253,000. The money for the payment and cancellation of the balance of said bonds is held as a special fund by the Treasurer.

The bonds to the amount of $1,000,000, at 6 per cent., maturing Jan. 1, 1881, secured by a mortgage upon the Navy Yard property at Philadelphia, were extended for a period of 20 years from that date, at 5 per cent. interest, on terms which yielded a premium to the company.

In order to enable the Philadelphia & Erie Railroad Company to provide for the payment and cancellation of $5,000,000 of the 6 per cent. bonds of that company, maturing March 30, 1881, guaranteed principal and interest by the Pennsylvania Railroad Company, your company purchased of the Philadelphia & Erie Railroad Company a certain amount of the bonds secured by its general mortgage, the interest thereon being reduced from 6 to 5 per cent. per annum. Of these bonds, $5,000,000 were guaranteed, principal and interest, by the Pennsylvania Railroad Company, and disposed of on satisfactory terms.

There are now in the sinking fund for the redemption of the obligations of the various companies forming the United New Jersey Railroad & Canal Company, securities to the par value of $1,479,000. There is also a cash balance, uninvested by the trustees, of $42,629.64. Your company also holds an additional amount of $124,000 of bonds, which have been redeemed, making an aggregate investment of $1,645,629.64, for which you will in the future, in accordance with the terms of the lease, receive bonds to be issued under the general mortgage of that company.

The car equipment of your lines, both east and west of Pittsburgh, was further increased during the year to the extent of 3,000 box and 2,500 coal cars; 1,500 of these box cars were placed upon the western lines, and the residue of the equipment upon those east of Pittsburgh. These cars were paid for by the proceeds of the 5 per cent. certificates of the Railway Car Trust of Pennsylvania. Similar arrangements have been made with the Pennsylvania Car Trust to provide the means to pay for such additional cars as may be required the present year. These certificates have become a favorite form of investment, and in order to remove the objection to their temporary character by reason of their liability to redemption at short intervals, the new issue will mature at fixed dates, running from one to ten years, so that purchasers will know when the principal of the certificate will be paid. Orders have been given, under the arrangement referred to, to build 3,300 cars, the larger part of which will be constructed at the company's shops.

It will be remembered that under the terms of purchase of the property of the Empire Line, tank car certificates were issued to the amount of $900,000 to represent the value of the oil equipment bought from that company. There being $531,250 of these certificates outstanding July 17, 1880, it was deemed advisable that the company should avail itself of its privilege of anticipating their payment, and they were accordingly redeemed and canceled. These cars now appear in the equipment account at a valuation of $450,000, or one-half their actual cost. The Empire Line continues to show very satisfactory results and such as fully confirm the propriety of its purchase.

The total amount of car trust certificates issued has been $8,327,000, of which $3,289,000 have been redeemed, leaving $5,048,000 outstanding Dec. 31, 1880.

COMPARISONS.

The earnings and expenses on all lines east of Pittsburgh and Erie were as follows:

	Gross Earnings.	Expenses.	Rental and Interest on Equipment.	Net Earnings.
1880	$41,220,072.49	$24,625,047.57	$2,728,562.13	$13,906,462.79
1879	34,630,279.17	20,384,746.15	2,129,010.50	12,108,528.52
Increase	$6,639,793.32	$4,242,307.42	$599,551.63	$1,797,934.27

The gross and net earnings per mile of the various divisions were as follows:

	Penna.		United N. J.		Phil. & Erie.	
	1880.	1879.	1880.	1879.	1880.	1879.
Gross earnings	$23,203	$19,963	$24,068	$19,908	$12,944	$10,735
Net earnings	10,657	9,146	7,17	6,682	4,7.5	3,339

The gross earnings of the main line from Philadelphia to Pittsburgh, 358 miles, were $62,873.56 per mile, against $52,786.09 per mile in 1879.

The percentage of expenses to gross earnings on the several lines for four years has been:

	1880.	1879.	1878.	1877.
Penna. R. R., Main Line	51.98	51.71	52.91	55.47
Penna. R. R., including branches	54.07	54.05	53.75	56.63
United N. J., Main Line	67.99	64.57	.....	.....
United N. J., including branches	70.86	67.93	65.50	69.50
U. N. J., including branches and Canal	71.16	66.44	66.40	71.30
Delaware & Raritan Canal	79.00	46.97	55.50	53 30
Phila. & Erie	63.27	68.90	70.00	64.60

The Main Line of the United New Jersey is the 89 miles from Jersey City to Philadelphia.

TRAFFIC.

The traffic of the lines east of Pittsburgh and Erie was as follows:

	1880.	1879.	Inc. or Dec.	P.c.
Passengers carried:				
Main line and branches	7,757,940	5,948,645	I. 1,809,295	30.0
United Railroads of N. J.	8,218,532	7,204,654	I. 1,013,878	14.1
Philadelphia & Erie	598,570	449,102	I. 149,468	33.3
Total	16,575,042	13,602.401	I. 2.972,641	21.8
Passenger mileage:				
Main line and branches	196,939,640	155,784,178	I. 41,155,462	26.4
United Railroads of N. J.	171,055,377	146,914,158	I. 24,141,219	16.4
Philadelphia & Erie	14,792,169	11,562,653	I. 3,229,516	28.0
Total	382,787,186	314,260,989	I. 68,526,197	21.8
Tons freight carried:				
Main Line and Branches	15,364,788	13,684,041	I. 1,680,747	12 3
United Railroads of New Jersey	5,824,840	5,052,995	I. 771,845	15.3
Philadelphia & Erie	4,861,463	4,130,126	I. 731,337	17.7
Delaware & Raritan Canal	1,348,082	2,103,510	D. 755,428	36.0
Totals	27,399,173	24,970,672	I. 3,183,929	12.7
Tonnage mileage:				
Main Line and branches	2,298,317,322	2,136,708,887	I. 161,608,435	70.6
United Railroads of New Jersey	381,885,409	332,298,977	I. 49,586,432	15.0
Philadelphia & Erie	559,280,067	505,918,017	I. 53,362,050	10.5
Delaware & Raritan Canal	53,508,532	85,552,368	D. 33,046,836	38.0
Totals	3,292,991,330	3,061,478.249	I. 231,513,081	8.6

The average distance traveled by each passenger in 1880 over the Main Line and Branches was 25.4 miles, and in 1879 was 26.2 miles, showing a decrease of 0.8 of a mile.

In connection with the passenger business, it may be stated that during 1880 there were handled on the three divisions east of Pittsburgh and Erie 1,283,962 pieces of baggage as against 1,070,451 in 1879. The entire payments for lost and damaged baggage amounted to $407.12.

The number of tons of freight moved over the Main Line and branches, including 976,780 tons of fuel and other materials for the company's use, was 16,341,568 tons; for the previous year 14,457,502 tons were moved, showing an increase of 1,884,066 tons, or 13.03 per cent. Of the 15,364,788 tons of individual freight transported over the Main Line and branches, 2,067,360 were through and 13,297,428 local freight.

The coal shipments increased 729,857 tons, and the coke shipments 384,871 tons, the aggregate tonnage being 7,494,723 tons as against 6,379,995 in 1879, a gain of 1,114,728 tons. The east-bound coke movement shows a further increase of 84,647 tons over the preceding year, and the west-bound a gain of 300,224 tons, the aggregate of all shipments being 1,612,881 tons as compared with 1,228,010 in 1879. The oil and grain traffic both show a decrease for the year.

There was a marked increase in the movement of west-bound freight, both local and through, the former showing a gain of 27.99 per cent. and the latter 26.58 per cent. There was also an increase of 8.17 per cent. in the mileage of local east-bound freight.

It will be seen that the cost of transporting this traffic was increased over the preceding year by the marked advance in the price of labor and materials, and that it was only through the economical movement of a heavier tonnage that your lines were able to earn a fair profit.

On the United Railroads of New Jersey there was a largely increased movement in both local and through west-bound tonnage, the aggregate increase in both directions being 771,845 tons, or 15 27 per cent., with an almost equivalent increase in mileage.

The Delaware & Raritan Canal shows a decreased coal tonnage of 674,489 tons, which will account for its loss of revenue and largely increased percentage of operating expenses.

The Philadelphia & Erie Division also moved a heavier tonnage during the year, the gain being 731,337 tons, or 17.71 per cent., the increased mileage being mainly on through traffic.

The receipt and cost per unit of traffic were as follows, in cents:

	Penna. R.R.		United N. J.		P. & E.		All lines.	
Per passenger mile:	1880.	1879.	1880.	1879.	1880.	1879.	1880.	1879.
Receipt	2.253	2.281	2.126	2.173	2.912	2.944	2.222	2.255
Cost	1.604	1.682	1.691	1.641	2.413	2.923	1.674	1.709
Net	0.649	0.599	0 435	0.532	0.499	0.021	0.548	0.546
Per ton mile:								
Receipt	0.880	0.798	1.672	1.473	0.360	0.512	0.918	0.824
Cost	0.474	0.427	1.204	1.012	0.358	0.354	0 540	0.480
Net	0.406	0.389	0.468	0.461	0.202	0.158	0.378	0.344

Sixty-five locomotives were built at Altoona during the year for the Main Line, and 20 for your other roads east of Pittsburgh; 80 passenger, 8 postal, 6 combined passenger and baggage, and 8 express cars were also built at that point, together with 225 box, 407 gondola, 43 stock, 13 oil tank and 41 cabin and miscellaneous cars. This was in addition to 3,000 box and gondola cars built there under the trusts hereinbefore referred to. At the shops on the Philadelphia & Erie Railroad, 4 passenger, baggage and express cars were rebuilt, and 140 box, gondola and cabin cars.

There were used upon the Main Line and branches 11,425 tons of steel and 719,051 ties; on the Philadelphia & Erie 2,379 tons of steel and 183,545 ties, and on the United Railroads of New Jersey Division 3,417 tons of steel and 262,341 ties, making a total of 17,221 tons of steel and 1,164,937 ties.

CONTROLLED COMPANIES.

The tonnage of the Pennsylvania Canal was 861,798 tons, an increase of 55,276 tons. The earnings were $368,769.90; net earnings, $183,799.98; interest, $185,400; deficit for the year, $1,600.02.

The results from the controlled coal companies were as follows:

	Gross earn.	Net earn.	Interest.	Profit.
Susquehanna Coal Co.	$2,341,844.13	$360,828.29	$151,021.79	$264,806.50
Summit Branch	1,028,469.35	120,679.75	85,869.81	34,809.94
Lykens Valley	701,175.39	48,907.80	.....	48,907.80
Mineral R. R. Mining Co.	1,269,762.67	284,814.08	224,955.51	39,858.57

This result compares with a considerable net loss in 1879. The total amount of coal mined by these companies was 1,560,206 tons; sold, 1,544,483 tons; average price, $3.35 per ton, against $2.68 in 1879.

The results from the controlled railroad companies may be summed up as follows:

	Earnings.	Net receipts.	Charges.	Profit or Loss.
Northern Central	$5,050,387	$2,043,634	$1,417,791	P. $625,843
Baltimore & Potomac	790,147	157,484	272,342	L. 114,858
Richmond & Danville	1,990,347	843,881	610,555	P. 233,326
Cumberland Valley	536,946	230,200	220,539	P. 9,661
Allegheny Valley	1,919,519	832,302	1,651,835	L. 819,533
West Jersey	758,691	275,562	212,636	P. 62,926
Camden & Phila. Ferry	151,101	56,648	10,860	P. 45,788

Charges on Cumberland Valley road include 10 per cent. dividends on the stock.

The American Steamship Company has continued its regular service during the past year with results comparing favorably with previous years, and your company have not been called upon to make any direct advances on account of their guarantee of the bonds. The efficiency and earning capacity of this line would be very materially increased by the construction of additional vessels of larger carrying capacity, the expediency of which, however, has not yet been fully determined.

LINES WEST OF PITTSBURGH.

The following statement gives the result of the lines controlled by the company, west of Pittsburgh, operated by the Pennsylvania Company and the Pittsburgh, Cincinnati & St. Louis Railway Company:

	1880.	
The total earnings of the Pennsylvania Company on lines operated by it and through organizations worked under its control were	$18,260,245.20	
Expenses for same period were	9,745,303.22	
Leaving net earnings	$8,515,041.98	
From this deduct: Rentals, interest and liabilities on all kinds chargeable thereto	6,130,108.79	
Net profit on Pennsylvania Company's lines		$2,384,933.19
The total earnings of the Pittsburgh, Cincinnati & St. Louis Company on lines operated by it and through organizations worked under its control were	$11,243,744.56	
Expenses for same period were	7,809,234.84	
Leaving net earnings	$3,434,509.72	
From this deduct: Rental, interest and liabilities of all kinds chargeable thereto, including the net earnings of the Columbus, Chicago & Indiana Central Railway, paid over to the Receivers under order of Court	$2,661,401.50	
Net profit on Pittsburgh, Cincinnati & St. Louis Railway Company's lines		773,108.22
Net profit on lines west of Pittsburgh, as above		$3,158,041.41
Net profit on lines west of Pittsburgh for 1879		1,824,088.36
Increase in 1880		$1,333,953.05

It will be noted that the lines west of Pittsburgh continue to show a marked improvement in their net results, which, while largely attributable to the exceptional prosperity of the country, is at the same time due to a considerable extent to the watchful care and good management of the officers to whom are confided the direct control and oversight of these properties.

The other lines west of Pittsburgh, in connection with which the company has assumed liabilities, or which it controls through the ownership of stock, but which are worked through their own individual organizations, are the St. Louis, Vandalia & Terre Haute Railroad, Indianapolis & St. Louis Railroad, St. Louis, Alton & Terre Haute Railroad, Grand Rapids & Indiana Railroad and roads operated through its organization, Cleveland, Mount Vernon &

Delaware Railroad, Massillon & Cleveland Railroad from Oct. 4, and East St. Louis & Carondelet Railway.

	1880.	1879.
The aggregate gross earnings of these roads were	$6,234,183.96	$5,007,413.52
Expenses	4,531,680.41	3,562,907.73
Net earnings	$1,702,503.55	$1,444,505.79
Deduct rental and interest	2,049,166.22	2,013,016.69
Loss	$346,662.67	$568,510.90
Of this loss your company, under existing contracts, is directly or indirectly responsible for	80,644.56	141,762.24
Which deducted from the profit before stated	3,158,041.41	1,824,088.36
Leaves a net profit on all lines west of Pittsburgh	$3,071,386.85	$1,682,326.12

Showing a gain for 1880 of $1,389,070.73.

The difference between this amount and the balance shown by the income accounts of the Pennsylvania Company and the Pittsburgh, Cincinnati & St. Louis Railway Company is due to the fact that the actual advances made during the year were $50,956.68 less than the deficits shown by the operations of the roads.

The Pennsylvania Company, after paying to this company in cash the interest upon all of its obligations and a cash dividend of 4 per cent. upon its entire capital stock, was able to pay off and cancel, in addition to the bonds redeemed through the sinking fund, $1,400,000 of its debentures, and also provide out of its own resources the capital for the required improvements and additions to its properties.

The Pennsylvania Company and the Pittsburgh, Cincinnati & St. Louis Railway Company continue without any floating indebtedness.

Of the issue of $3,200,000 of Pennsylvania Company bonds, secured by a pledge of Pittsburgh, Fort Wayne & Chicago Railway stock as collateral, $79,000 were redeemed by the sinking fund during the year; pending the settlement of the liability of these bonds for state tax, 11,000 more have been purchased, which are held by the trustees as a special fund, leaving outstanding $2,901,000.

The annual contribution of $104,100 was paid to the trustees of the first and second mortgages of the Pittsburgh, Fort Wayne & Chicago Railway Company, for the purposes of the sinking fund, but owing to the scarcity and exceptionally high prices of these securities, the trustees were able to invest only a small portion of the funds in their hands. From their report there have been redeemed and are now held by them:

First mortgage bonds	$1,196,000.00
Second mortgage bonds	1,258,000.00

And the balance of cash in the hands of the trustees uninvested Dec. 31, 1880, was:

On account of first mortgage sinking fund	$153,362.93
On account of second mortgage sinking fund	246,450.40

An additional sum of $79,356 was paid into the sinking funds provided for the redemption of existing mortgages on the other leased lines west of Pittsburgh.

During the past year this company acquired the few outstanding shares of the Pennsylvania Company, thereby placing the ownership of the entire capital stock, both common and preferred, under its control. It was therefore deemed unnecessary to continue the distinction between the two classes of stock, and the preferred was merged into the common.

The Newport & Cincinnati Bridge, crossing the Ohio River at Cincinnati, being closely connected with the workings of the Western lines and coming especially under the supervision of their officers, it was deemed best that the stock held by the company in the bridge should be transferred to the Pennsylvania Company. This was accordingly done, and there was received in payment therefor $1,000,000 of stock of the latter company, so that the aggregate amount of its stock, all of which is now held by this Company, is $12,000,000.

To enable the Pennsylvania Company to provide the necessary means to fully carry out the objects for which it was organized, to wit, the economical control, management and development of the lines west of Pittsburgh, and to take advantage of any opportunity that may offer to reduce the interest on the obligations of those lines for which it is or may hereafter become responsible, a general mortgage to secure bonds to the amount of $20,000,000, bearing interest at 4½ per cent. per annum, has been authorized. These bonds, as they may from time to time be issued, will be guaranteed, principal and interest, by the Pennsylvania Railroad Company, in order to obtain the utmost advantage from the combined credit of the two companies. The proceeds of this loan, as it may be disposed of, will only be used to protect the obligations of the Pennsylvania Railroad Company and the Pennsylvania Company, and to advance their joint interests.

The betterment expenditures upon your lines west of Pittsburgh for the year amounted to $1,138,457.68, in addition to $24,583.42 expended by the Indianapolis & St. Louis Railroad Company. The Pennsylvania Company received during the year $546,067.94, leaving a balance due on account thereof and expenditures formerly made, including $637,453.40 due by the Columbus, Chicago & Indiana Central Railway Company of $1,814,285.29. The work of further improving the condition of your Western lines was steadily prosecuted during the year, and to that end extensive renewals were made in steel rails, additional portions of the tracks ballasted with cinder and stone, and large repairs made to bridges. The main line of the Pittsburgh, Fort Wayne & Chicago Railway, the main line of the Cleveland & Pittsburgh Railroad, between Rochester and Cleveland, and the main line of the Pittsburgh, Cincinnati & St. Louis Railway are now laid with steel rails.

There were laid, during the year, on the Northwestern lines, operated directly in your interest, 6,696 tons of steel, and upon the Southwestern lines, 12,842 tons of steel and 12,325 tons of rerolled iron rails.

The motive power and equipment upon these lines have not only been maintained, but their condition much improved. Heavier engines have partially replaced the light ones formerly in use, this change being indispensable to the economical movement of their large traffic.

The new Union passenger depot, at Chicago, referred to in the last report, is nearly completed, and will be opened for business about April. In addition to furnishing the facilities so urgently needed by your company at that point, it also brings some of the most important western lines directly into the same station upon such terms and conditions as will not only lighten the expense, but bring much indirect benefit to your company. The additional tracks, and other facilities in connection therewith, will be completed in a short time. The cost of these improvements will be about $1,000,000.

Upon the Southwestern lines large improvements have been made in the way of substituting iron for wooden structures, steel for iron rails, and in rebuilding various stations; a limited portion of the cost thereof has been charged to capital account.

The construction of the new and commodious passenger depot and the freight buildings at Cincinnati, and the alteration of the yard tracks adjacent thereto, were commenced in the latter part of the year, but owing to the inclemency of the season the work has not been completed; when finished, your company will possess excellent facilities for handling traffic at that large and important commercial centre.

The Grand Rapids & Indiana Railroad continues, under careful and efficient management, to show a steady improvement; and your company was not called upon during the year to extend to it any financial aid. The statements of the operations of the Land Department for the year are very favorable, showing sales of 48,350.70 acres for $757,990.46, or an average of $15.67 per acre, as against a general average of $12.87 for the entire period during which the lands have been sold. The amount of assets on hand Dec. 31, 1880, applicable to the redemption and payment of the first mortgage bonds of the company, was as follows:

Balance in the hands of the trustees	$548,961.73
Bills and accounts receivable	670,935.45
Cash in the hands of cashier	123,019.20
Total	$1,342,916.38

The entire number of acres sold up to December 31, 1880, was 276,953.32, and the aggregate price received for the same, $3,565,296.94. The amount of land unsold is 576,007 acres. Out of the proceeds of sales the Trustees were only able to purchase during the year $56,000 of bonds, owing to their price being above the limit fixed in the deed of trust. This amount was converted into income bonds, making the total issue thereof outstanding Dec, 31, 1880, $1,043,000.

Several efforts were made during the past year to effect a compromise of the litigation existing with the Columbus, Chicago & Indiana Central Company, but without successful results, and it remains in the same position as at the time of the last annual meeting. Since the close of the year the securities of the company have passed largely under the control of a few parties, who have evinced a strong desire to reach some amicable settlement of the question at issue. It is hoped that some arrangement may be consummated, in which the interests of the Pittsburgh, Cincinnati & St. Louis Railway Company and of this company will be properly protected.

The litigation between the St. Louis, Alton & Terre Haute Railroad Company and the Indianapolis & St. Louis Railroad Company (in which latter the Pennsylvania Company is largely interested as a shareholder) has not reached any conclusion.

The traffic of all the lines operated directly west of Pittsburgh was as follows:

	1880.	1879.	Increase
Passengers carried	9,665,994	8,261,565	1,404,429
Passenger mileage	221,783,885	209,515,697	12,268,188
Tons freight carried	22,302,391	20,166,334	2,136 057
Tonnage mileage	2,426,038,735	2,272,716,185	153,322,550

The business of these lines shows an increase as great as that of the main line.

SUMMARY OF ALL LINES.

The summary for all lines directly worked east and west of Pittsburgh is as follows:

	1880.	1879.
Passengers carried	26,241,036	21,863,966
Passenger mileage	704,571,071	583,776,686
Tons freight carried	49,701,464	45,137,006
Tonnage mileage	5,719,030,065	5,334,104,434
Gross earnings	$70,764,062.25	$60,362,575.67
Expenses, rentals and interest	42,179,485.63	35,639,794.99
Net balance	$28,584,576.62	$24,722,780.68

The increase this year in net balance is $3,861,795.94.

The aggregate amount of steel rails laid in 1880, on all the lines owned, controlled, or operated by your company, was 54,012 tons.

GENERAL REMARKS.

From the report of the managers of the Trust Fund, duly audited in accordance with the terms of the trust, it will appear that up to Dec. 31, 1880, there have been paid into the fund $1,300,000, and that securities have been purchased of the par value of $1,401,850, yielding an interest of 6.84 per cent. per annum upon the investment. As a misapprehension seems to exist in the minds of some of the shareholders as to the conditions governing this trust, it may be well to state that the original suggestion, that scrip should be issued to the shareholders to represent the sums paid therein, was, upon full examination by the General Solicitor, determined to be of doubtful legality, and therefore, in the plan of the trust, as finally approved by the shareholders, March 11, 1879, no provision was made which would permit the issuing of such scrip, as has since been suggested by some of the stockholders.

Of the amount paid by the county of Allegheny for loss and damage occasioned by the riots of July, 1877 ($1,600,000), this company received $1,322,035.14, the balance being paid to the Western and auxiliary lines, to which it was due. This money has been appropriated to reimburse the capital account for the impairment in value resulting from the destruction of your property at the time referred to. As some of the shareholders seem to have expected that this money would be distributed in the shape of an additional dividend, it may be proper to say that such action could not be taken, as the sum secured from Allegheny County, added to that retained in the treasury through the temporary cessation of dividends, was not equivalent to the loss entailed by the destruction of the company's property and the decrease in revenues resulting from the stoppage of traffic.

A statement of the insurance fund is also attached, duly audited, showing assets therein at the close of the year of the value of $736,281.09, being an increase over the previous year of $73,089.53.

During the present year the board will have under consideration the construction of some important improvements to aid in properly developing the sections of country naturally tributary to your lines, and to afford additional facilities to your continually increasing traffic. Among them may be noted the following:

At Jersey City, the extension of the present dock, adjacent to Pier No. 3, inland for a distance of 904 feet, making, when completed, a dock 2,240 feet long and 200 feet wide, probably the largest at that port; and in connection therewith the erection of brick warehouses for the storage of merchandise for import or export. This will enable ocean steamers and sailing vessels to be brought in direct connection with the tracks and other facilities of the company, obviating to a large extent the necessity for the expensive system of lighterage now used in the storage and handling of traffic at that terminus. These improvements will probably require an outlay of about $750,000 to render them effective.

It may be noted in this connection that the company have, in pursuance of the policy intimated in the last report, purchased the equipment of the National Lighterage Company of New York, which, together with the steamboats and car floats purchased the previous year, and the other floating equipment owned by the company at that port, now numbers eighty-three. The purchase of this floating equipment enables the company to transact its lighterage and transfer business without the intervention of that organization, and will lessen the former heavy charge on freight revenues.

Pressing necessity exists for an additional grain elevator at the port of Philadelphia. With the view of concentrating the handling of the export traffic and in order to secure to the company the control and indirect ownership of the best point at this port for dock improvements and the erection of elevators, negotiations have been commenced with the parties now owning the Girard Point property, upon which a large elevator and other improvements are already constructed, for its purchase, with the object of organizing a company to build additional elevators and docks. In this new organization this company will secure a controlling interest, without any additional investment, as they now hold a large amount of the obligations of the International Navigation Company secured upon the property referred to. It is believed that the necessary funds for the erection of another elevator during the present year can in this manner be obtained without the advance of additional capital upon the part of this company. The estimated cost of this improvement is about $600,000.

The approach to the new passenger depot in the city of Philadelphia and the station building will be of the most substantial character. Its location is immediately adjacent to the Public Buildings, the geographical centre of the city, and very close to the centre of population. It will bring the beautiful country on the Main Line of your road at Bryn Mawr and adjacent thereto, as well as that on the New York Division, nearer in point of time to the business part of the city than much of the thickly built portions now occupied by private residences. The construction of this work is already having a marked effect upon the development of local traffic, and it is believed that, in addition to its great value to through and competitive business, it will, in a few years, by its promotion of suburban trains reaching the Park and other portions of the city, and its stimulus to the traffic before referred to, fully realize all that was anticipated at the time of its original conception.

The largely increased traffic on the portions of the road adjacent to the cities of Philadelphia and Pittsburgh is so seriously interfering with the prompt movement of freight trains that the extension of the present four tracks for a further distance of about fifteen miles at each end of the line will be rendered necessary for its prompt and economical movement. As the right of way for the tracks, for this distance, is nearly all acquired, their cost will not be so serious a matter as would at first appear, and will probably not exceed the sum of $1,250,000. A portion of this work will be commenced the present year.

The construction of the branch from the Connecting Railway to Germantown, Chestnut Hill and Norristown has not been commenced, owing to the difficulties of determining the proper route and negotiations for the right of way, both of which are matters of more than usual importance, in view of the valuable and thickly-settled country traversed by the proposed line.

The parties owning and controlling the large and extensive iron ore mines and furnaces located at Cornwall, in this state, have taken the necessary steps for the construction of a branch road to connect with this company's line near Conewago station. The construction of this branch will bring to the road a considerable amount of traffic.

The great pressure of traffic upon the steep gradients ascending the eastern slope of the Allegheny Mountains has brought to the attention of your officers the propriety of relaying the track upon what is known as the "New Portage Railroad." This was originally constructed by the state of Pennsylvania to avoid the passage of the Allegheny Mountains by inclined planes, and was purchased from the state by this company. The mountain tunnel and general location of this line follow very closely those of your own road, making a connection with your branch line near Hollidaysburg. The relaying of this track will not be very expensive, as the road-bed is generally in a good state of preservation. It will relieve the Main Line of the local traffic from the large iron works and mines in the vicinity of Hollidaysburg, and afford an alternate line on the most difficult and expensive portion of the Mountain Division.

About 16 miles of the western end of the Lewisburg & Tyrone Railroad, connecting with this company's line near Tyrone, and developing an extensive iron ore district, have been completed, and a further extension will be made during the present year.

Several extensions of branches have been made on the Southwest Pennsylvania Railway to develop the adjacent coke region. This road is now one of the most important local feeders of the Main Line, and further extension of its branches will be made the present year.

For the purpose of promoting and aiding the development of what is known as the Snow Shoe bituminous coal field, and securing its traffic to your lines, the board have authorized the purchase of the Bellefonte & Snow Shoe Railroad, a branch about 24 miles long, for the sum of $275,000, thereafter proposing to consolidate it with its connecting line, the Bald Eagle Valley Railroad, which is controlled by this company by ownership of shares and leasehold.

The rapid increase of both the local and through traffic, interchanged between this company's two principal western lines and the Main Line, through the city of Pittsburgh, has so seriously interfered with its proper movement, that some provision to relieve this overcrowded portion of the road seems imperative. With this object in view, it is proposed to extend the Western Pennsylvania Railroad to a connection with the Main Line, near Bolivar, and reduce its gradients. The completion of this work will enable the traffic of the Pittsburgh, Fort Wayne & Chicago Railway to avoid passing through Pittsburgh, and afford a line of very low gradients as far eastward as the Allegheny Mountains. The great economy thus effected in the transportation of traffic, together with the relief it will afford to the Pittsburgh Division of the Main Line, it is believed, will largely repay the interest on the cost of such an improvement, which will probably not exceed $750,000. The improvement being made on that portion of the Pittsburgh, Virginia & Charleston Railway which connects the Pittsburgh, Cincinnati & St. Louis Railway with your road at Port Perry, about 13 miles east of Pittsburgh, will also enable the through traffic of the latter line to avoid the present detention. Both of these improvements will progress only as the pressing necessities of the traffic may demand.

The Pittsburgh, Virginia & Charleston Railway has been extended 23 miles to Brownsville, and during the present year it is proposed to make a further extension to a connection with the Southwest Pennsylvania Railway near Uniontown, occupying a partially graded line previously purchased by this company, thus opening the southern portion of the coke fields to a direct connection with Pittsburgh by a continuous descending gradient. This extension will be seventeen and a half miles long, and will cost about $500,000. It is believed that the additional trade thus secured will make the investment which your company now have in the Pittsburgh, Virginia & Charleston Railway Company directly productive.

With the object of promoting an increase of traffic upon some of the branch lines acquired under the lease of the New Jersey roads arrangements have been made for the construction of a line of railway from the eastern terminus of the Pemberton & Seashore Railroad to the coast, and thence

northward to a connection with your road at Squan. This will afford a very direct and short line, and develop a large and attractive section of the seashore. The new portion will be about thirty miles long, and will be known as the Philadelphia & Long Branch Railway.

Probably the most important piece of work completed by the Company during the past year was that connecting the tracks in West Philadelphia with what is known as the Delaware Extension, heretofore detached from the Main Line, and only reached over the tracks of another company. This was finished June 17, since which time the very large amount of traffic delivered to points on the Delaware River, south of the city, has passed over this line, and the company thus been enabled to save a large interest on its cost.

Some litigation has again arisen in reference to the use by other railroad companies of a portion of the Main Line in the West Philadelphia yard. As the title to this part of the road, which had been previously disputed by the Junction Railroad Company, was finally adjudicated in favor of this company by the Supreme Court of Pennsylvania some years since, it is confidently believed that the effort now being made on the part of foreign railroad companies, through the instrumentality of the Junction Railroad Company, to use this property to your injury will not be successful; especially as it involves the running of their passenger trains through the most crowded part of the West Philadelphia yard, which has been specially constructed and arranged for the accomodation of freight traffic and from which your own passenger trains were excluded several years since, at great expense to the company, on account of their grave interference with the prompt movement of your freight traffic and the serious peril involved therein to both life and property. All freight traffic that it is proper to handle in such yard can be expeditiously moved; but the effort now being made is to require passenger trains to be passed rapidly and on a fixed schedule through said yard, regardless of their interference with the freight traffic or of the constant danger to which they are thus exposed. It is to be hoped that if these foreign lines continue to desire a connection through the city they will not expose their passenger trains to such risks, but will construct an independent line entirely free from the hazards referred to.

On Jan. 17, 1880, the company concluded a contract with the American Union Telegraph Company for a period of twenty years, which is not exclusive in its terms, nor does it prevent any of your lines from doing such telegraph business for the public as they may by law be authorized to do. This contract secures a more adequate compensation to the company and its auxiliary lines than they have heretofore received for the privileges granted to other telegraph companies. It was confidently hoped that a similar contract would have been made with the Western Union Telegraph Company, then occupying your lines. This has not been realized, and as the board believed that the company did not pay a proper rental for the occupancy of your properties, and had no legal rights upon a portion thereof, notice was given to it on Sept. 30 last, to remove therefrom its poles and fixtures. Through the litigation arising out of this notice a judicial determination will be reached as to the relative rights of the parties. Pending this result, agreements have been made between the formerly competing telegraph companies now occupying your lines which may render new contracts necessary to thoroughly protect your interests.

The harmonious relations existing between the various trunk lines in reference to the maintenance of proper and uniform rates on freight, have with few unimportant exceptions continued, and it is gratifying to observe that, under the present system of the railway service, the public have been better served and rates have been more equitable and uniform than during any previous year. Notwithstanding the marked advance in the cost of labor and all materials that form so large a part of railway expenses, neither passenger nor freight rates have made any material advance, but, in many instances, show a reduction, so that at the present time it may be safely said that in no part of the world are the public provided with equal railway facilities for the carriage of passengers, nor is merchandise transported so cheaply as on the American railways. It would therefore seem that it might be safely assumed that the public are not so much in need of state or Congressional legislation for proper protection against oppression or excessive rates, as are the solvent and better organized railway companies in need of legislation to provide against undue or unwise competition, which reduces rates below a compensating point, and prevents the railways from furnishing the public with such facilities as the requirements of the traffic demand, and also to prevent the organization and promotion of irresponsible companies, which project and construct unnecessary lines designed more for speculative purposes than for the true interests of the public. If Congress, instead of acting hastily on so important a subject, will appoint a competent commission to examine and report on the railway interests of this country, it will probably appear that if any legislation is advisable it will be of the latter character in preference to the former.

The results of the past year, as shown by the statements herewith presented, reflect largely the great prosperity of the country, following a long period of depression. While there may seem no reason to expect an immediate reverse in this condition of affairs, yet the great cheapness of money, combined with this prosperity, is inducing capital to promote wild railway schemes that must finally bring loss to their owners and entail an additional burden upon the public. It is, therefore, proper that all railway companies, like your own, whose shares are so largely and widely distributed (as an evidence of which we may state that the number of shareholders on your books at the last dividend period was about 13,000), and often held by those mainly dependent upon their dividends, should so manage their affairs as not to depend too strongly upon this seeming prosperity, which must, undoubtedly, be followed by adverse seasons. Your management have, therefore, deemed it wise so to conduct the affairs of your company that while it returns what may be regarded as a reasonable, if not a large, dividend to its shareholders, a proper reserve shall be held to provide against these periods of depression, so that a uniformity can be maintained in its dividends, and your properties at the same time kept up to that full standard of efficiency essential to enable it to meet successfully the schemes of irresponsible competition. It may be noted here that of the 59,149 shares of your stock bought from the city of Philadelphia and held in trust, 47,443 shares have been distributed to the shareholders on account of the dividends declared in May and November last, the premium upon which, added to the cash dividends then paid, makes an aggregate for the past year of nearly 8 per cent. Special allusion is made to this matter from the fact that grave exception has been taken by some of the shareholders to the policy of not dividing at each dividend period the entire net receipts of the company, the latter being the policy that obtains so strongly in England, where a considerable portion of your shares is hold, but which in this country has never been pursued without weakening a railway company and entailing upon it the necessity of periodical reductions, if not a suspension of its dividends. It is believed by your management that if this policy were to be applied in this country, and especially by the Pensylvania Railroad Company, whose interests are so widely diversified, it could but result in diminishing its efficiency and eventually returning less dividends to its shareholders. It may be proper at this point also to correct the impression, prevailing more strongly abroad than in this country, that the revenues of your company to an unreasonable extent are devoted to new construction work and such outlays charged to expenses. This the shareholders may be assured is not the fact. The cost of all new construction work not properly chargeable to the expense account is each year added to your capital account, the funds for this purpose, for the past two years, having been obtained largely by the sale of such securities owned by the company as it was deemed wise to dispose of.

On the first of June, 1880, Mr. Thomas A. Scott, the former President of the Company, felt constrained, under the advice of his physician, to tender his resignation, which the board accepted with great regret. Mr. Scott had been identified with the Company for nearly thirty years, and the best portion of an active life had been spent in promoting and protecting its interests. It is most earnestly hoped that relief from the heavy responsibilities inseparable from his official position will serve to restore the health and prolong the life of one whose unceasing efforts and unwearying labors were always freely bestowed for the prosperity and success of this Company.

Mr. George B. Roberts, the first Vice-President, succeeded Mr. Scott as President, and Mr. A. J. Cassatt was chosen First Vice-President.

For the responsible position of General Freight Agent of the company, made vacant by the death of Mr. Kingston, announced in the last annual report, the board selected Mr. J. McC. Creighton, formerly Manager of the Empire Line, whose successful administration of that and other positions held by him in the service of the company gave assurance of continued good results in the wider field to which he was assigned.

The following changes have also been made necessary during the past year:

Mr. Henry W. Gwinner, who held a responsible position in the Passenger Department of the company, and was highly esteemed by all of his associates, resigned his position for more lucrative employment elsewhere. The vacancy thus caused was filled by the appointment of Mr. Max Riebenack. Mr. J. R. Erringer, Jr., was appointed General Ticket Agent of the Pennsylvania Railroad Division in April last to fill the vacancy caused by the death of Mr. Theodore A. Stecher.

The board have, with a sense of deep regret, to record the recent death of Mr. Josiah Bacon, who served as a director of this company for a period of nearly 25 years. One of the earliest and most earnest advocates of the building of the Pennsylvania Railroad, he was also a firm supporter of such railway enterprises as served to develop this and adjoining states. His long experience, good judgment and sterling integrity were of great value to the company. Mr. William Thaw, of Pittsburgh, intimately associated with the transportation interests of the country for many years past, and largely interested in your properties, was elected to fill the vacancy thus caused.

From these statements it will be noted that neither the Pennsylvania Railroad Company nor any of the corporations for which it is responsible have any floating indebtedness except that held in your own treasury.

The board have again to express their acknowledgments to the officers and employés of the company for the faithful and efficient discharge of duty and zealous service, to which are to be attributed in no small degree the successful results obtained during the past year.

Dr. GENERAL ACCOUNT, PENNSYLVANIA RAILROAD COMPANY.

			During Year 1880. Increase.	Decrease.
To capital stock		$68,870,200.00		
To first mortgage bonds due 1880	$2,103,000.00			$2,867,000.00
To general mortgage bonds due 1910	19,999,760.00			
To consolidated mortgage bonds due 1905	28,610,540.00			291,000.00
To consolidated mortgage bonds due 1919	5,000,000.00		$5,000,000.00	
To Navy Yard mortgage registered bonds due 1881	1,000,000.00			
To lien of the state upon the public works between Philadelphia and Pittsburgh, bearing 5 per cent. interest, payable in annual installments of $460,0 0, applicable first to the interest, and the remainder to principal; the original amount of which was $7,500,000	3,833,066.78			258,608.92
To mortgages and ground rents payable	1,499,037.46		195,157.55	
		62,046,304.24		
Accounts payable, viz.:				
To passenger and freight balances due other roads	$341,099.36			53,381.72
To pay rolls and vouchers for December, 1880, due in January, 1881	3,466,947.68		679,848.93	
To bills payable	Nothing			1,040,000,00
To cash dividend due to stockholders unpaid	153,199.50		25,691.75	
To dividend scrip of December, 1873, outstanding	1,298.61			595.00
To sundry accounts due other roads	2,590,155.88			365,443.83
		6,552,692.03		
To appraised value of securities owned by the United New Jersey Railroad & Canal Company and transferred with the lease of the works of that company		3,895,584.60		
To equipment of road and canal owned by the United New Jersey Railroad & Canal Company and transferred with the lease of the works of that company		3,163,704.53		255,300.00
To fund for the purchase of securities guaranteed by the Pennsylvania Railroad Company, under trust created Oct. 9, 1878	$1,300,000.00		600,000.00	
To 655 consolidated mortgage bonds redeemed and canceled	634,460.00		291,000.00	
To balance to credit of profit and loss	7,793,948.71		3,612,875.38	
		9,728,408.71		
		$154,256,894.11	$10,404,573.61	$5,131,329.47
Less amount of decrease			5,131,329.47	
Total amount of increase			$5,273,244.14	

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			During Year 1880. Increase.	Decrease.
By balance standing on the books of the company for the construction of the railroad between Harrisburg and Pittsburgh, including branches to Indiana, Holidaysburg and Morrison's Cove; also branch to connect with the Pittsburgh, Virginia & Charleston Railroad; also bridge over the Susquehanna River at Columbia, and branch from Columbia to York, in all 353 12-100 miles; also the extension of the Pennsylvania Railroad to the Delaware River, including Wharves and Grain Elevator, and the Filbert Street Extension to Fifteenth and Market streets, Philadelphia ($1,329,803.67), and cost of stations, warehouses and shops on the whole road from Philadelphia to Pittsburgh	$28,990,987.31		$1,942,440.54	
By balance standing on the books of the company for the purchase of the Philadelphia & Columbia Railroad	5,375,733.43			
By balance to debit of equipment of road, consisting of 877 locomotives, 612 passenger cars, 175 baggage, mail and express cars, 17 647 freight cars, and 1,556 road cars, including shop machinery, steamboats and car floats, and also including equipment of canal, consisting of schooners, barges and tugs	18,038,200.96		344,896.47	
By cost of real estate of the company and telegraph line	10,858,151.34		1,000,596.43	
Total amount charged to construction, equipment and real estate accounts for the railroads between Philadelphia and Pittsburgh, comprising 1,096.36 miles of single track (exclusive of Harrisburg & Lancaster Railroad, 98.70 miles), including sidings, stations, warehouses, shops and shop machinery, telegraph lines, canal equipment, etc., etc		$63,263,073.04		
OTHER ASSETS.				
By cost of bonds of railroad corporations	$23,734,825.15			$1,785,753.00
By cost of capital stocks of railroad corporations	30,742,960.73			981,006.73
By cost of bonds and stocks of municipal corporations, coal companies, bridge companies and investments not otherwise enumerated	7,355,895.98			881,241.26
Total cost of bonds and stocks belonging to the company		61,833,681.86		
By managers of trust created by Pennsylvania Railroad Company, Oct. 9, 1878		1,300,000.00	600,000.00	
By insurance fund		10,000.00		
By mortgages and ground rents receivable		69,735.00	40,000.00	
By amount expended for the purchase of anthracite coal lands, Hazleton, Hamilton, Eastwick and other tracts		764,256.03		28,059.38
By appraised value of securities owned by the United New Jersey Railroad & Canal Company, and transferred with the lease of the works of that company		3,895,584.60		
By equipment of road and canal owned by the United New Jersey Railroad & Canal Company, and transferred with the lease of the works of that company		3,163,704.53		255,300.00
By amount of fuel and materials on hand for repairs to locomotives, cars and maintenance of way, viz.:				
For the Pennsylvania Railroad	$1,820,738.13		707,190.35	
For the United New Jersey Railroad & Canal	678,109.56		175,534.48	
For the Philadelphia & Erie Railroad	316,568.34		87,455.51	
		2,815,416.03		
By amount of bills and accounts receivable, and amounts due from other roads, including advances made to railroad corporations for construction and purchase of equipment used on their lines, viz.:				
Philadelphia & Erie Railroad Company	$21,500.73			317,858.22
United New Jersey Railroad & Canal Construction	399,411.23		135,993.05	
United New Jersey Railroad & Canal Sinking Fund and Redemption Account	1,139,280.00		112,290.00	
United New Jersey Railroad & Canal real estate	500,976.45		81,241.70	
Other companies	8,870,491.27		2,882,242.87	
		10,931,659.66		
By cash balance in hands of the Joint Stock Bank, London, and other parties, to pay coupons due in January, 1881		1,155,035.90		3,900.30
By cash balance in hands of freight and passenger agents	$1,831,713.83			177,373.97
By cash balance in hands of Treasurer	3,223,033.63		1,593,225.60	
		5,054,747.46		
		$154,256,894.11	$9,703,737.00	$4,430,492.86
Less amount of decrease			4,430,492.86	
Total amount of increase			$5,273,244.14	

E. & O. E.